

ABSTRACT

Title of Document: Growing Place: Intersecting Architecture, Food & Education in an Interstitial Urban Collage

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As cities continue to rapidly expand in population, their dependence on external resources generates sociocultural challenges. How we plan to feed this growth of urban occupancy is one of the many challenges cities face in the near future. Current large-scale food systems are failing to provide access, resources and most importantly education that sustains the relationship between people, the built environment and the food they consume. This thesis engages this global issue at a regional scale and explores the opportunity for architecture to serve as a cultural and educational foundation for supporting self-reliant urban environments. Investigating the existence of food deserts in Baltimore, this thesis critiques current academic institutions and food supply centers such as grocery stores, and re-imagines them through a design exploration of the interactive market place. The design proposes a hybrid of civic, social and institutional building agendas that connect place with program through exposing a Baltimore vernacular – the marketplace – and reinterpreting the cyclic nature of food production and distribution as a place of learning. Acting as an urban anchor both at a geographical and programmatic scale, this proposal uses architecture to expose, intersect and engage people with the processes of food from which they are frequently separated.

GROWING PLACE: INTERSECTING ARCHITECTURE, FOOD
& EDUCATION IN AN INTERSTITIAL URBAN COLLAGE

By

Leah Natasha Davies

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Acknowledgements

“There are four great motives for writing (or any other creative endeavor):

Sheer egoism

Aesthetic enthusiasm

Historical impulse (to record)

Political purpose in its broadest sense - a desire to push the world in a certain direction, to educate other people's ideas of the kind of society they should strive for.”

- George Orwell

This thesis acknowledges those that write and design for the latter - for education, social justice and politics within the built environment.

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01. INTRODUCTION

“Architecture is not just form making. Architecture can influence lives; contribute to the local economy; and add to the cultural life of the local people.

It is exciting for an architect to be part of the process: to listen to the local community, add something meaningful that was not there before, and in the process enrich people lives.”

- Jo Noero

“To reverse the devastation of nature, we need to reverse the devastation of culture.” – Bryan Bell

As the global population continues to rise and occupancy of urban cities increases, the way in which one builds to sustain the current urban lifestyle is also changing. Good architecture is both a form of problem solving and a way of designing inhabitable human environments. In cities around the world, concerns for energy use, water consumption and food production also continue to grow. How we plan to feed and sustain our cities is one of greatest challenges our growing world faces. Currently, there is a strong dependence on external resources with little to no connection between where they are coming from and where they end up. This is especially apparent in the food culture of American cities. Supermarkets lack an educational component that shares any information about where or how food is grown; a small nutrition label on the back of processed foods is the extent of available knowledge and the focal point of public ignorance.

Similarly, while the American academic calendar was originally designed around children being out of school in the prime months of crop yield, today there is little to no education regarding agricultural production in schools. At times, laws restrict the connection – further advocating for the separation between agriculture and the learning environment. The processes in which food is brought into the city and the act of distribution have evolved to a state of disconnect; ultimately diminishing the ability of the urban dweller to understand how the most precious resource of all relates to the lifestyle they sustain.

This thesis engages the social, cultural and academic relevance of this situation by investigating the relationship between architecture, food, education and the people within an urban community; asking the question: how are these relationships currently manifested in the built environment? And how can they be re-imagined in order to conceive of and stitch these experiential relationships?

Building off of the rich history of public markets in Baltimore, it also examines the notion of creating place within a “food desert” in an interstitial site within the city. By

investigating place-based education as a foundation for design, one can use architecture as a means to engage the issues of food access within the urban context.

Architecture is a language – capable of teaching its occupants about the way one moves and interacts with one another, how one uses and programs space, and how one relates to back to the surrounding environment. Understanding this linguistic sequencing and material nature as it applies to place-based and program-based education, as well as food distribution, will be the focus of this design exploration. While there are infinite components in making architecture, the notions of exposing, interesting and engaging are experiential ones – suggesting a focus on the sequencing and experience within the design.

Inherent in this idea, is the role of interpreting and engaging the regional culture of Baltimore – understanding the demographics of the city, the needs of its dwellers and existing cultural and architectural responses to educational and food based programs. To design regionally - to design well - one must recognize “that architecture is inevitably a social act... on that looks at improving the present condition through design.”¹ The present condition of this thesis is a vacant urban landscape - part of a large system of food deserts at the geographic center of the city.

1 Heath, Kingston. *Vernacular Architecture and Regional Design: Cultural Processes and Environmental Responses*. Oxford: Elsevier Ltd. 2009, xiiv

02. POSITION

“What is needed is an architecture of change – an architecture that moves the field beyond the design of buildings and toward the design of new processes of engagement with communities.”

– Bryan Bell

ARCHITECTURAL POLEMIC

The lack of suitable, healthy, and sustainable produce in many urban environments is, in the opinion of this thesis, a contributing element in the growing rate of both cultural and physical decomposition. Studying the potential for architecture to generate learning environments around urban agriculture is about more than just the production of food in cities such as Baltimore; it is about the social interconnections and process of community growth generated through built forms, material, and spatial organization.

How can architectural design be expanded to not only address malnourished neighborhoods, but at the same time, to be utilized as a means of addressing global issues of food production in our rapidly expanding population? How can a single building design bring people from around the city to engage in the process of food production and distribution?

Determining an architectural agenda that explores the notion of education and city participation on a regional scale through a globally determined program, allows for design to become a part of lifestyle processes, not products. Active, local actors are capable of creating solutions for the urban community and for themselves so long as the educational tools and spatial design are providing opportunities to do so. Cities are dynamic entities, frequently changing due to both internal and external forces. In response, an architecture installation of this agenda and size must be responsive and capable of evolution (acting as a social process), and it requires designing regionally at a physical level (at the scale of its spaces) yet, globally at a conceptual one.

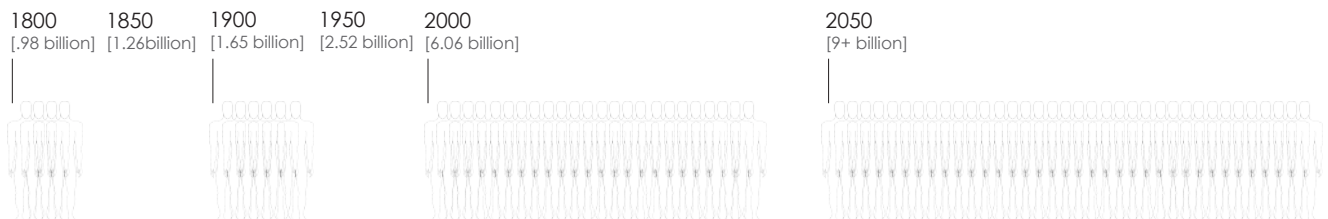
It is important to recognize that this thesis is not proposing architecture or the implementation of agricultural space within a city as the cure-all of social, economic, or environmental injustice; rather, it proposes a design investigation that yields an architectural foundation that creates appropriate conditions for community organizations and residents to generate higher social, economic and environmental learning; a spatial

hypothesis which yields stronger interaction between people, the built environment, and the natural processes required to sustain urban communities (i.e. food production) – resulting in more access, knowledge and resources, and thus enabling the urban dweller.

THE WORLD AND ITS FOOD

There are four primary steps in the food process: production, processing, transportation, and consumerism. Each is a separately controlled entity that contains issues that adversely affect the health and well being of both our environment and those at the latter end of the process.

In late October of this year (2011), the United Nations estimated that the global population reached 7 billion people – an unfathomable number given that the population rested at 1.65 billion in 1900. With rapid expansion over the past century, this rate is only projected to increase over the next 40 years – estimating a world population of over 9 billion by 2050.²

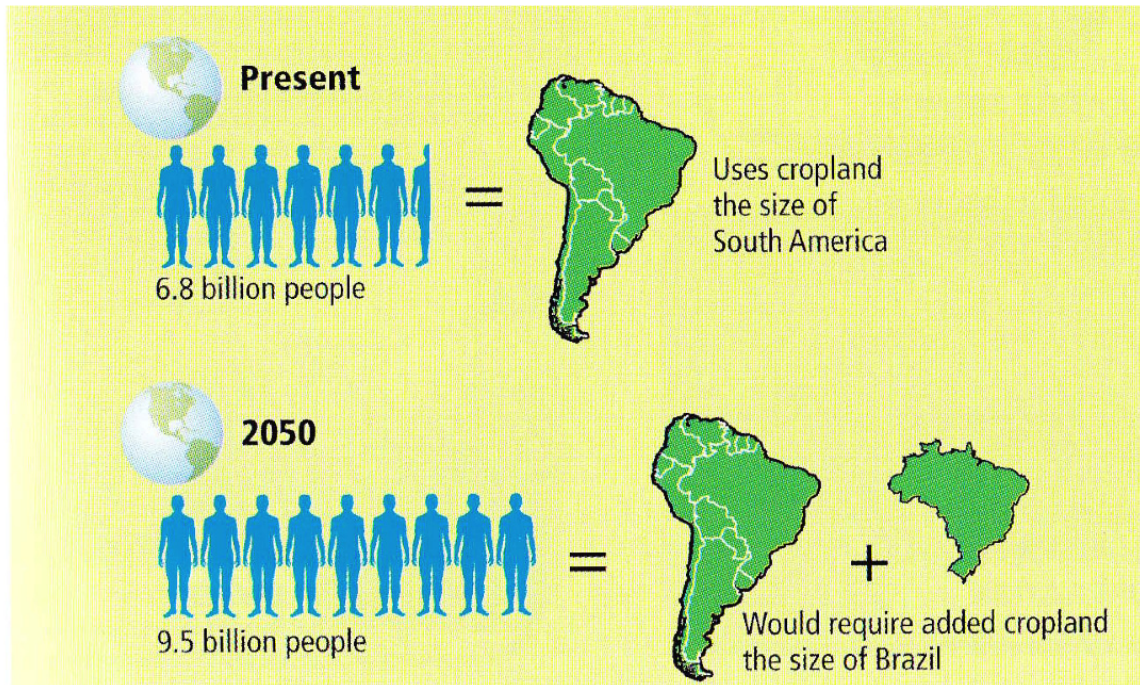


[Figure 1] World population diagram

Currently, it takes 98% of the earth's arable land to feed the population – a landmass equivalent to that of South America. If the population were to grow to over 9 billion in the not too distant future, it would take an additional landmass the size of Brazil to sustain it using traditional means of crop production.³ Similarly, while less than 1% of the American population claim agriculture as a profession, a large majority of the population live entirely off commercial crop production.

² "United Nations Population Information Network." <<http://www.un.org/popin/>>

³ Despommier, Dr. Dickson. *The Vertical Farm: Feeding the World in the 21st Century*. New York: St. Martins Press, 2010 p82



[Figure 2] Feeding the World, Agriculture and Land Use

Monoculture is also growing component in the failing food system. Acres upon acres of land dedicated to the production of a single crop are reducing the nutrient levels in soils. Exposure to a single crop may be more efficient for harvest, however soils require a variety of plant media to maintain a healthy chemical balance. Easily grown species of fruits and vegetables, known as “cultivars” were selected during agricultural initiatives of the late 19th century for their taste and appearance and produced in bulk – reducing access to specie variety. Apples for example, have evolved to over 20,000 different species, of which only around 7500 are commercially available. Potatoes are similar.⁴ “Nature had never planned for monocultures; biodiversity was and still is the rule that enables the establishment of functional ecosystems.”⁵

After these foods are grown and harvested, the process of packaging, preserving, and transporting them begin. Food travels an average of 1500 miles from farm to store shelf; again, an alarming statistic given the current oil crisis and effects on global warming. Every truck, plane, or shipping container utilizes precious resources in a

4 Ibid. p 62

5 Ibid. p 64

process that could be eliminated through a reintegration of food and the city. Our current reliance on fossil fuels is not only becoming economically unfeasible, but the growing awareness of environmental impact is building a strong need for internal self-reliance in many urban communities. Currently, 1/5 of all fossil fuels consumed in the US are a result of farming - growing, processing, production, transportation, and refrigeration.⁶ Re-envisioning the way we grow, store, buy and interact with our food not only reduces the financial burden of fossil fuel based transportation, refrigeration, water consumption and chemical inputs, but consequently generates money that can stay within the local economy and job market where the food is being produced.⁷

The largest environmental issue addressed by urban farming is that of the “3000 mile salad”.⁸ Ingredients from most restaurants in city centers come from over 1500 miles away, which not only creates immense dependence on fuels but also expands the time period between when food is harvested and when it is consumed - an average of 5-8



[Figure 3] Monoculture of apples and potatoes



[Figure 4] Photos of monoculture agricultural fields

6 Despommier, Dr. Dickson. *The Vertical Farm: Feeding the World in the 21st Century*. New York: Thomas Dunne Books, 2010 p 168

7 Ibid. p xiii

8 Carter, Majora. “Greening the Ghetto”. TED Talk. Web < http://www.ted.com/talks/lang/en/majora_carter_s_tale_of_urban_renewal.html>

days from the time it is harvested to the time it appears on the shelf. Typical fruits and vegetables however, start losing nutrient value immediately after harvest, and generally contain no nutritional value by 14 days past harvest.

In writing this thesis, research was conducted to determine where supermarkets in Baltimore got some of their produce from. Other than Whole Foods, which uses some local farms, not a single person was able to explain where their vegetables originated. The most specific answer received was the name of a state.

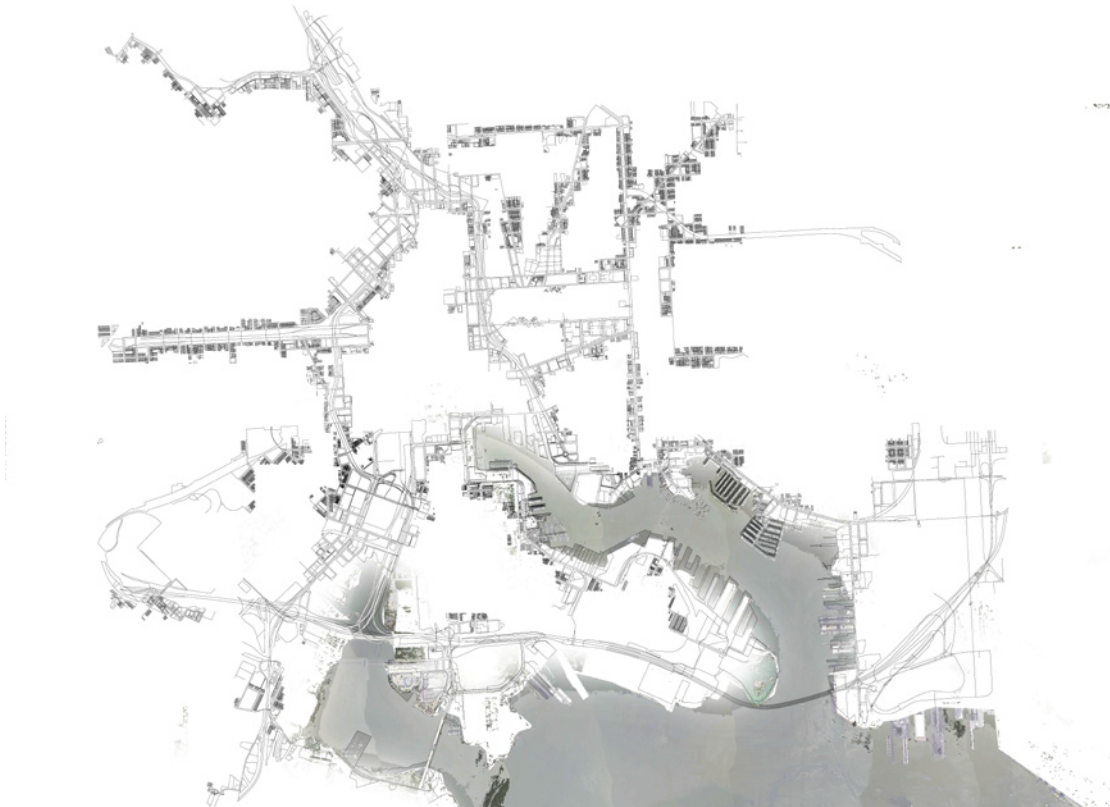
According to the John's Hopkins Center for A Livable Future, of the many billions of dollars spent on food advertising, almost 70 percent goes toward promoting convenience foods, candy, snacks, alcoholic beverages, and desserts, while ads for fruits and vegetables, grains or beans only account for 2%.⁹ Statistics such as this resonate throughout food deserts (such as the site used for this thesis proposal) and generate a foundation for change of the current sociocultural environment. Changing consumer habits starts with changing the information available to them.



[Figure 5] A linear food process



[Figure 6] Diagram of average distance for food transportation



[Figure 7] Diagram map of Baltimore's primary transit arteries

WORKING AT THE SCALE OF THE CITY

“Common architecture serves as little as 2% of the population while the other 98% remain under served by the built environment...How can we expand the practice of design to provide for the rest, the great number currently under served, and to play and active role in responding to the social challenges we face in the world” – Bryan Bell

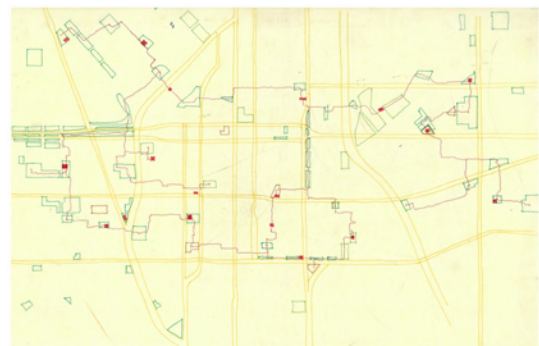
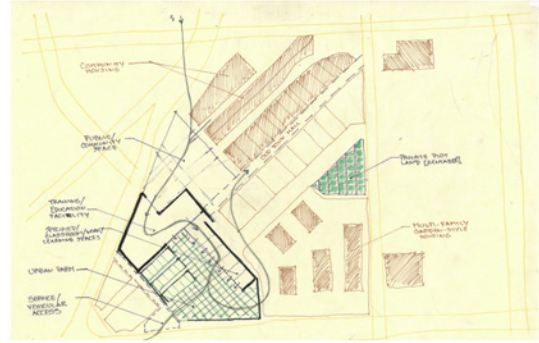
In looking at typical building typologies for places of learning, it is interesting to note that these building types are each a form of public architecture – one which anchors itself within a greater context. Chicago, a city plagued with food deserts and issues of neighborhood education, working toward change, asks the question: how can government forces within the city create stronger neighborhoods? The response: “you don’t tear down the old one and make something new on top. That has been tried and it generally hasn’t worked. You start by building community anchors: schools, libraries, parks, fire stations...”¹⁰ Currently the area surrounding the site chosen for this project houses a number of small-scale “anchors”. However, the scale of site and its relationship to the greater urban context creates an opportunity for a public anchor at the city scale – one whose scale of impact and scale of end-users exceeds the scale of the building.

Examining the population density of the site and its adjacent areas, one could assume a small grassroots intervention as a means of addressing the issues presented at a community level. As mentioned previously however, the intention for this thesis and the site identified is the relationship with the city. While food deserts are confined to single districts, the issues supporting them exist at a city scale.

An architecture that seeks to embed itself in an urban context and engage with both the inhabitants of a neighborhood, community, or city and the social agendas associated with it, must have a strong sense of spatial and programmatic hierarchy. This program is about redefining a current day market to become an interactive, food-based learning community. There are three scales of design at which this could be explored:

¹⁰ OWP/P Architects, VS Furniture, & Bruce Mau Design. *The Third Teacher: 79 Ways You Can Use Design to Transform Teaching and Learning*. New York: Abrams, 2010 p 128

0.1 The first is a singular architecture intervention that is perhaps owned and operated by an external organization. This would require a specific site, programmatically driven by the needs of the city. Its design would incorporate a series of sequential internal and external spaces that connect learning spaces with opportunity for places for growing, potential exhibit or activity zones, and other flexible working spaces.



03. COLLAGING PROGRAMS

“We are in a race between catastrophe on one side and education on the other.”
- H. G. Wells

CROSS FERTILIZATION

The objective of this architectural exploration is to rethink the existing design of urban academic institutions and food supply stores by analyzing how their programs can become integrated to create a larger scale of impact. It imagines a hybrid program that transforms a typical point of food allocation and consumer interest into an experiential and educational market hub for the city. While schools are formed around education, their only allusion to agricultural production is the calendar year which separates their program. In contrast, while current day grocery stores are generated as a response to food access, they lack an educational component that activates the relationship between food and its consumer. Analyzing and critiquing these existing programs generates an understanding of what is missing in the current relationship between food, education, community, and architecture while simultaneously setting up an argument for design intervention.

Considering the notion of cross disciplinary education and mutual learning environments plays a significant role in rethinking existing building programs of schools and grocery stores. The first step in reconsidering program as a hybrid of academic, consumer, and food based architectures is generating a program based not on “acceptable” square footages and spatial relationships, but an experiential program – one that is founded upon the idea of learning through sensory action and interaction. Studies show that incorporating physical activity in education is a significant way to maintain an engaged mind and body; translating these ideas to this thesis result in programmatic activities such as outdoor farm plots - serving dual purposes through community engagement and experience. Similarly, exposure to daylight and natural ventilation are proved to enhance the results of academic environments.

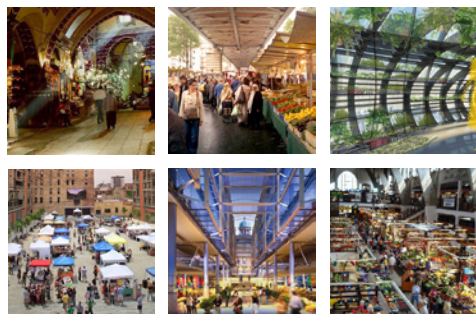
Elizabeth Ellsworth, in her book *Places of Learning*, describes the ways in which learning exceeds linguistic limitations; rather she describes its existence as an experiential and interactive act through media, architecture and pedagogy. Spaces, materials and



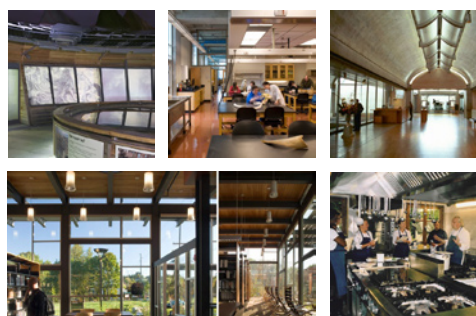
A PLACE FOR GROWING



A PLACE FOR STORAGE



A PLACE FOR BUYING & SELLING



A PLACE FOR FORMAL LEARNING



A PLACE FOR PEOPLE

images all become places of learning through the hands of designers who sculpt space, time, experience and objects with a pedagogical intent. “Architecture becomes pedagogical, pedagogy becomes architectural when together they create a fluid, moving pivot place that puts inside and outside, self and other, personal and social into relation.” Existing building typologies which offer pedagogy in an architectural program include: Civic building such as, community centers, libraries, education/learning/discovery centers, and organization headquarters; academic facilities, such as schools, Colleges and Universities; and public spaces like parks, pavilions, amphitheaters, and expo centers.¹ But what happens when one pushes these known building typologies? or better yet, merges them? In order to do so, it is important to understand the components that make them successful as single architectures as well as the scale in which they currently operate.

[Figure 11] Visual representation of experiential program components

1 Ellsworth, Elizabeth. *Places of Learning*. New York: RoutledgeFalmer, 2005 p37-38

AN ARCHITECTURE OF LEARNING SPACES

“The principal goal of education is to create men who are capable of doing new things, not simply repeating what other generations have done – men who are creative, inventive, and discoverers.”

– Jean Piaget

“The school is primarily a social institution... I believe that education, therefore, is a process of living and not a preparation for future living.” – John Dewey

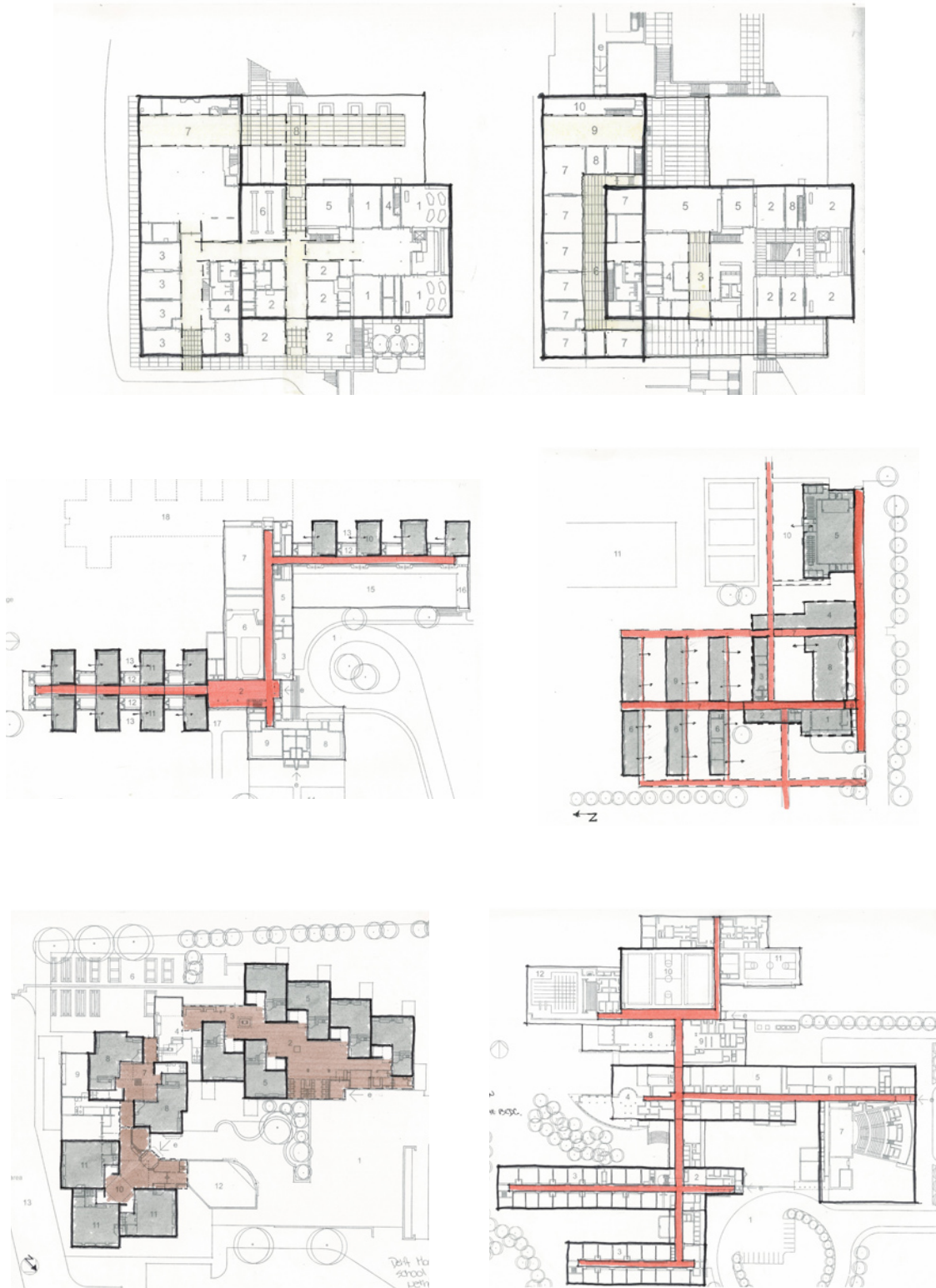
We learn from buildings. In the spatial and experiential realm, they teach us things that we did not know before occupying them. Design is not merely an aesthetic consideration, nor is it merely a spatial one; architecture must find ways to respond to its environment and the people within it. It is through these moments of intersection that architecture becomes a cultural act as well as a social product.

Education is not an outcome confined to academic programs such as schools and libraries. The program in this thesis explores the questions: how can we learn both from and within the buildings and spaces we inhabit? There are two ways in which humans learn; one way is through formal education and the second is through experiential learning. Formal education is typically conceived of in the



[Figure 12] Typical experience of a learning environment

academic realm; composed of student teacher interaction in a designated classroom setting. Experiential learning is what is conceived of as places where the opportunity for learning is provided and through interaction, where one absorbs knowledge or skill. This interaction can be a sensory – visual, auditory, tactile experience – or learning may occur through action or physical involvement. Both are founded on an architectural existence; the first through spatial and systemic configuration, and the second through craft and tectonic design relating to the senses. This thesis looks at both.

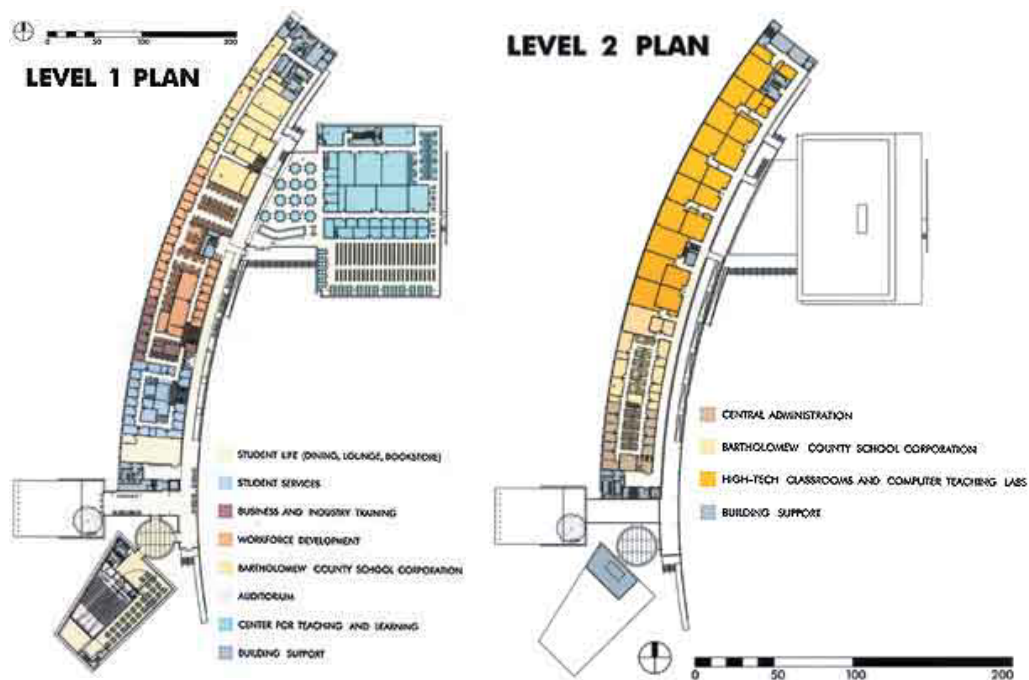


[Figure 13] Diagram series investigating learning spaces and circulation in modern schools

Some architectural examples of learning places used as precedents for this thesis include:

0.1 Columbus Learning Center, Columbus Indiana [Kohn Pedersen Fox Associates]

Designed as an expansion facility for three educational institutions, the building houses a series of learning, training and work spaces in a linear configuration which aims to express a horizontal connection to each of the three home institutions. There is a strong sense of linear connection on the old town Mall site which could be strongly reinforced through a linear parti. There is also a bold relationship back to the layout of a market place – with a central spine supporting the programmatic activity along the building edges.



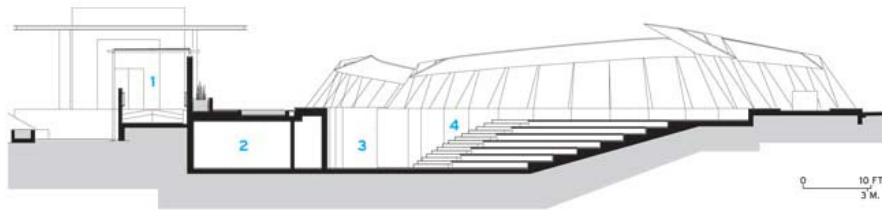
[Figure 14] Columbus Learning Center by Kohn Pedersen Fox Associates

0.2 Dhoby Ghaut Green, Singapore [SCDA]

Acting as the interstitial connection between architecture and landscape, this pavilion and amphitheater is a precedent for building form and experiential learning. Although it is not a place of formal learning, the visual and auditory experience supported by its built form sets the stage for sharing information.



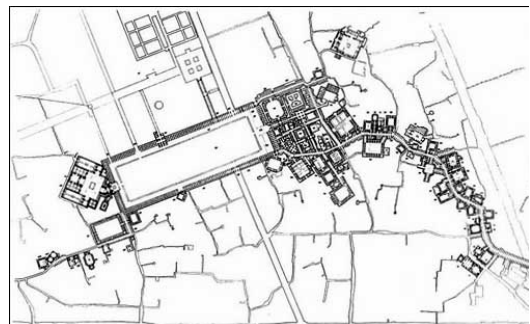
[Figure 16] Photo of Dhoby Ghaut Green theater



[Figure 17] Dhoby Ghaut Green theater section

0.3 Cultural marketplace

In many parts of the world, the marketplace is as much a place of information exchange as it is the exchange of goods. Persian bazaars are an example of architecture that reflects this interplay of social, cultural, and economic learning. A central spine organizes movement, while market stall “cells” reduced in scale occupy the edges of this spine.



[Figure 15] Persian Bazaar

FOOD BUILDINGS

“Is large-scale agribusiness going away? Probably not. Is it reasonable for Americans to completely return to an agrarian lifestyle in and immediately near our cities? Doubtful. Is it possible to add produce choices and agricultural efforts in our intense urban settings, exploiting the food-producing potential of our current network of under utilized public spaces? Indubitably.” - Darrin Nordahl

The supporting component of the program deals with food access and distribution to members of the city. How can the design of typical urban infrastructures change to mend the relationship between food and consumer, and create a relationship between food and education which currently does not exist? There are two significant agribusiness building typologies to be understood prior to design: Agricultural, such as hoop house, greenhouse, and storage facilities, and second grocery stores and markets which are economic reactions to current consumer lifestyle.

While food policy and planning departments are beginning to establish themselves as leaders in the urban food movement, technological and design based programs are also engaging the issue. Fields of study such as aeroponics, hydroponics, drip irrigations, vertical greens, microgreens, and others are making season extension and indoor growing more feasible, generating opportunities for agricultural infrastructure.

The Baltimore planning department has currently identified ten vacant, one-acre lots within the city to be re-configured as land for food growth by individuals interesting in urban farming - the “Vacants to Values” program. The organizers are requesting applications from citizens interesting in cultivating the city plots; asking that the potential farmers “demonstrate knowledge of the practical and business aspects of managing an agricultural operation.”² This thesis imagines a place of learning that can provide this knowledge. Integrating program with building tectonics and layout explores the polemic of how one can both learn form and within a built form.

Current day grocery stores are a consumer-based infrastructure, designed around the display and organization of food in a manner that supports monetary transactions.

2 “Down on the farm in the inner city.” Baltimore Sun Article: Print. April 21, 2011

While the “design” of large scale supermarkets is one of great thought, size, layout and product placement are all results of economic, not educational goals.

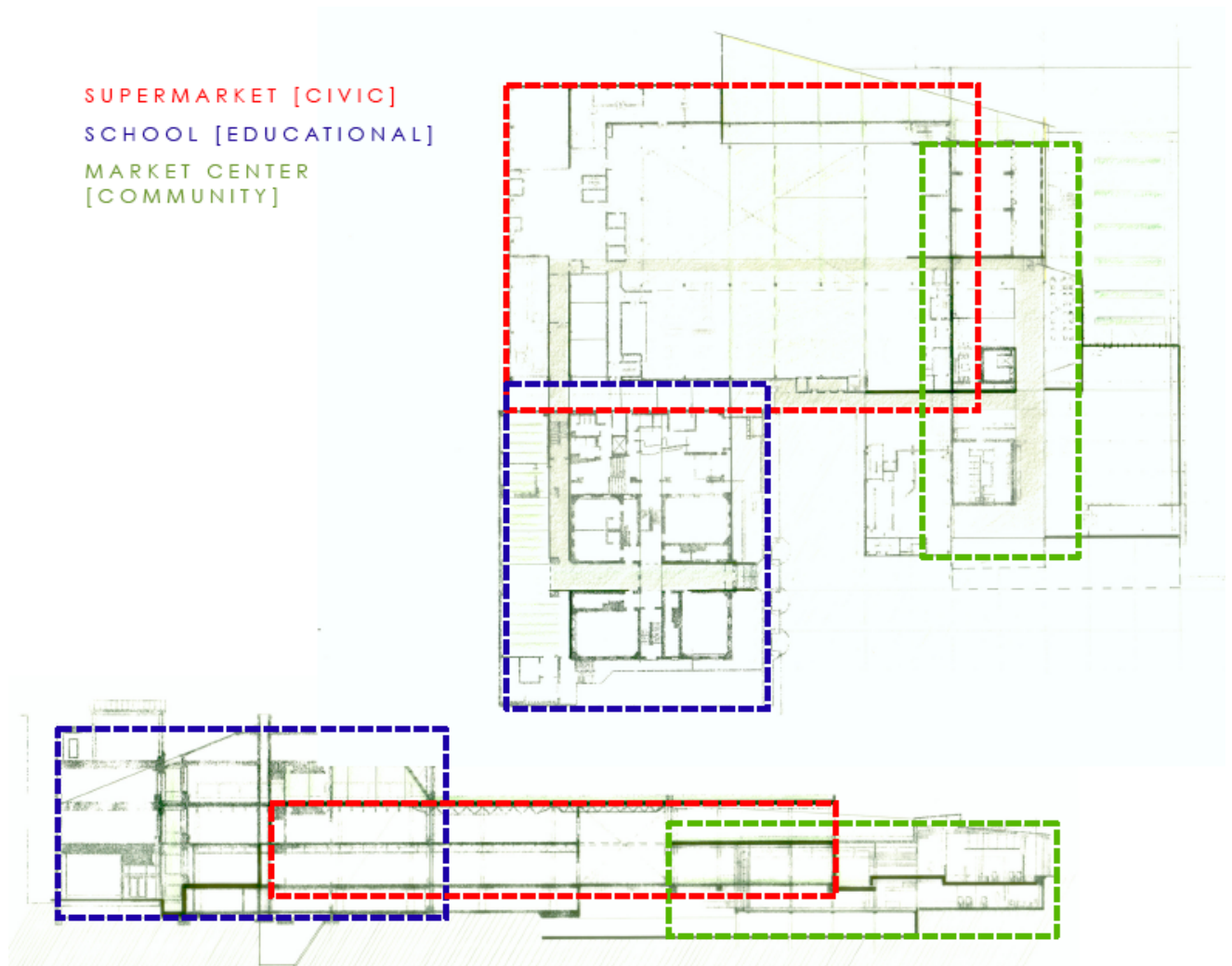
“Today, shopping is a theater.” According to Martin Pegler, a supermarket analyst, the rise of the 21st century has also sparked a new typology for food sales - “they reflect who we are and what we do today and they even mirror our changing goals and aspirations.”³ This is apparent in the rise of store such as Whole Foods and Greenwise - where the “green” food movement is both a means of marketing and a means of responding to cultural demands. Pegler goes on to explain that supermarkets have “become destinations; a place to meet - to see - to be seen - to eat.”⁴ Yet the architectural manifestation of this change is limited to our experience on a social level.



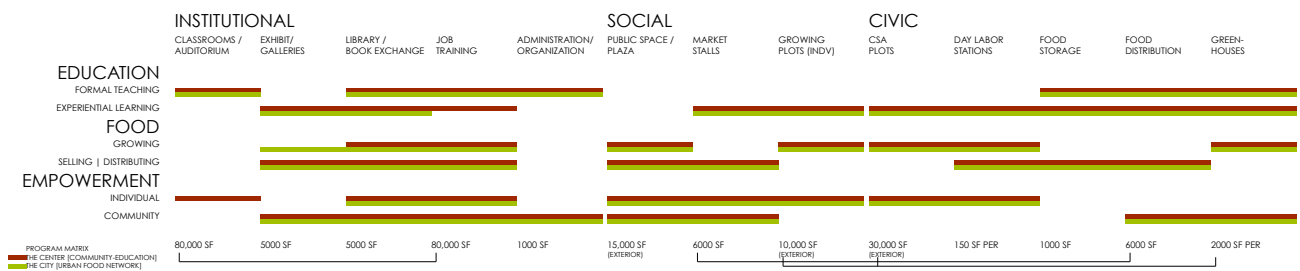
[Figure 18] Typical experience of a food retail

3 Pegler, Martin M. *Designing the World's Best Supermarkets*. New York: Visual Reference Publications, Inc. 2002 p7

4 Ibid.



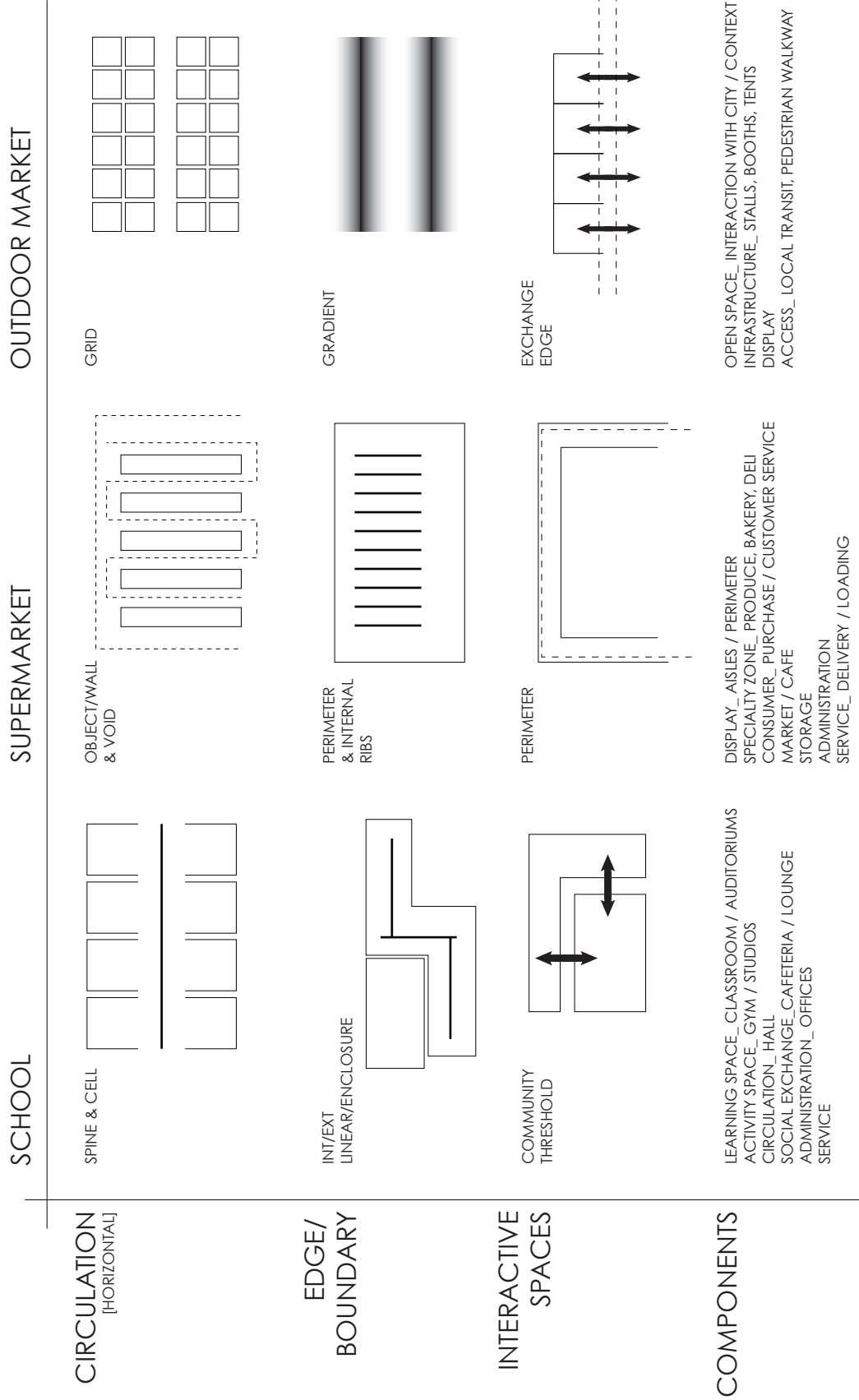
[Figure 19] Concept collage investigating programmatic relationships in form and scale



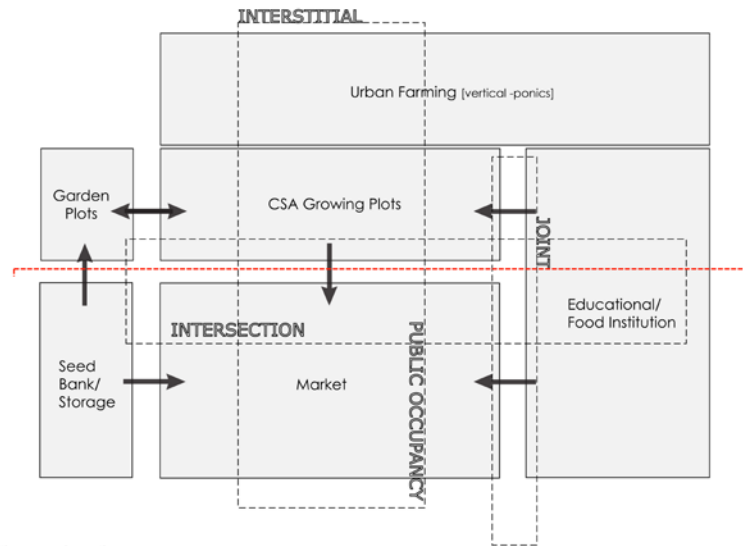
[Figure 20] Concept program diagram



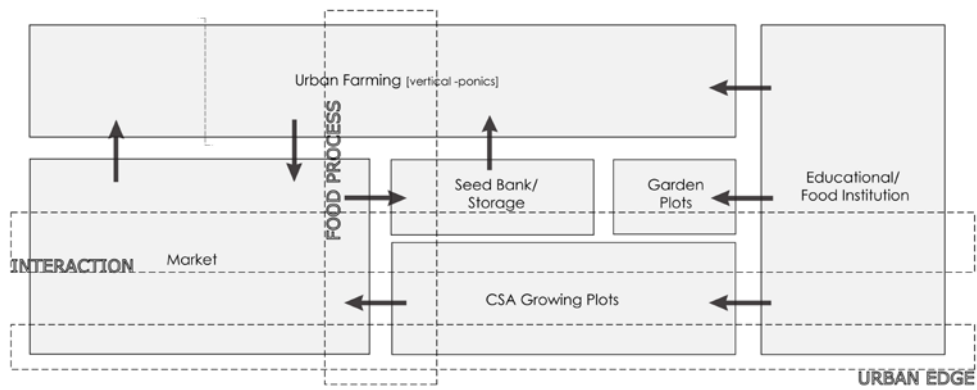
[Figure 21] Collage study investigating potential relationships between the architecture of supermarkets, schools and community buildings



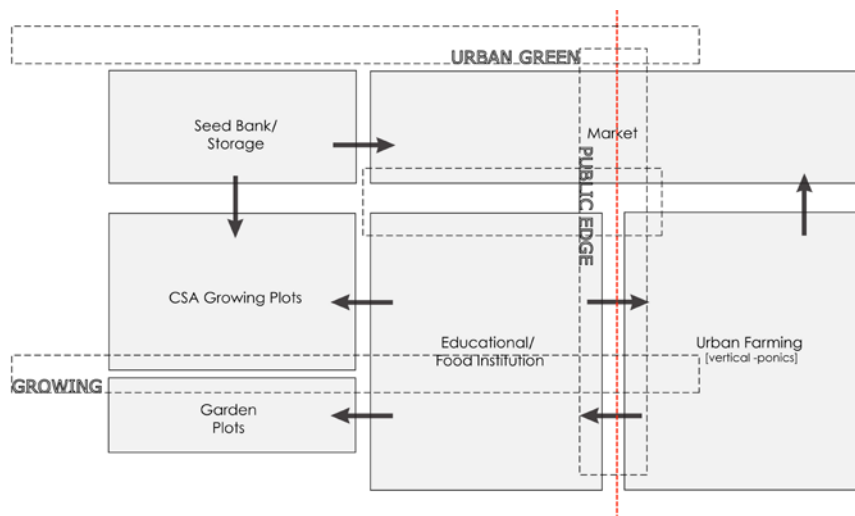
[Figure 22] Analysis of conventional building typologies



program adjacencies diagram [market hub]



program adjacencies diagram [linear processes]



program adjacencies diagram [institutional frame]

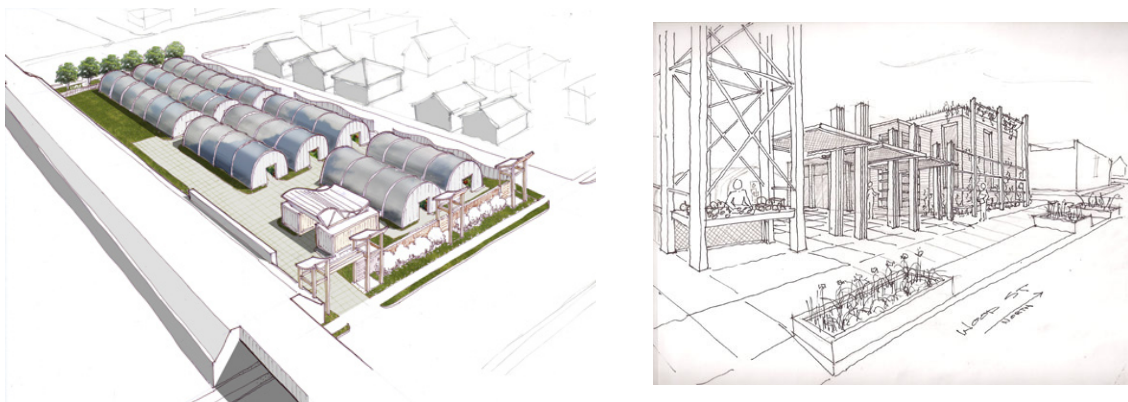
[Figure 23] Program adjacency studies for design intervention

EXISTING URBAN AGRIBUSINESS

0.1 Growing Home – Wood Street Urban Farm, Englewood, Chicago [Bohn & Viljoen Architects, UK]

Centered around urban farming, this project was design by Shed Studio to develop an urban agricultural district that “provide[s] business, job training and employment while improving the availability of fresh produce.” The Wood Street Urban Farm is a primary work site for Growing Home, a non-profit organization in Chicago, and is an architectural precedent for this thesis both in terms of its tectonic design and its functional program.

Similar to the Old Town Mall site in Baltimore, Englewood is a small, low-income urban community in Chicago that has suffered over the years from extensive neglect, resulting in a decreasing population and a high number of abandoned or vacant lots. The proposal aims to generate community growth through providing greenhouses for community members to harvest their own produce.



[Figure 24] Growing Home facilities

0.2 Niagra Community Food Center, Toronto

This public interface between food and the community operates in an urban park at the edge of the city. The Community Food Center (CFC) is conceived of as a “catalyst for [the] revitalization of our urban ecosystems, re-envisioning urban park land as points

of intersection between community and agriculture.” This architecture is one of the rare examples where elements of structure and materiality are given mutual hierarchy to the food process.



[Figure 25] Niagra Community Food Center

0.3 Continuous Productive Urban Landscape [CPUL], London

Understanding how urban agriculture can be utilized as a primary food source in cities is a matter of identifying appropriate sites and interweaving them at the scale of city. The design study conducted by Bohn and Viljoen Architects, founds itself on the premise that food is essential, while much other city consumerism is not; therefore, food production should take hierarchy in many underdevelopment / open nodes of the city. Bohn and Viljoen explain that much like roads, CPULs need to become an “essential infrastructure” in all urban areas. This project suggests that urban agriculture is achieved by transforming existing open spaces in a web of gardens and agricultural fields – generating a network of “productive spaces.” How these systems could be implemented differs for each city, but all urban environments have under used spaces and neglected lots which have the potential to be stitched through productive foodscapes.



[Figure 26] Mapping for CPUL in London

1.1 Community Food Center & Training Facility for Growing Power, Wisconsin

“The center offers schools, universities, government agencies, farmers, activists, and community members opportunities to learn from and participate in the development and operation of Community Food Systems.” In organization, the building creates a street edge while food based programs become an extension of the building into the landscape.



[Figure 28] Facility plan for Growing Power

2.1 Bumper Crop, Scottsdale, Arizona

This design competition entry in Arizona rethinks urban street markets through activating extensive urban hardscapes – transforming vast parking lots adjacent to commercial districts into zones of social and cultural interaction.



[Figure 27] Bumper Crop - design competition entry for a parking lot marketplace

Vegetables that can be grown using Hydroponic [water-based] systems:

Artichokes
Asparagus
Beans
Beets
Broccoli
Brussel Sprouts
Cabbages
Carrots
Cauliflowers
Celery
Cucumber
Eggplants
Leeks
Lettuce
Onions
Parsnips
Peas
Potatoes
Radishes
Rhubarb
Squash
Tomatoes - *one of the*

most popular plants grown hydroponically and can ripen as much as eight weeks earlier when grown in soil

Yams
Herbs that can be grown using Hydroponic [water-based] systems:

Arugula
Basil
Chervil
Chives
Coriander
Dill
Lemon
Balm
Mache
Majoram
Oregano
Rosemary
Sorrel Spear
Peppermint
Sage
Tarragon
Thyme

Other crops that can be grown using Hydroponic Systems:
[although more expensive and more challenging to grow – commercial/professional growing]

Corn
Cacao
Sugar cane
Rice
Tea
Tobacco
Cereal grains

04. URBAN INTERSECTION

“Landscapes become the medium through which to formulate and articulate solutions for the integration of infrastructure with viable programming that can address the pressing issues facing many cities around the world.”

- Gerdo Aquino

FOLLOWING THE FOOD

Baltimore is not a unique city when one considers its reasons for being. For thousands of years, food has been a determining factor in the evolution of the built environment. The notion of moving where the food is goes farther back than the civilization of man. Archeologists have found remnants of seed storages bins from approximately 11,300 BP.¹ Hunters and gatherers are an example of tracking locations of wild animals for food, but thousands of migrations and urban development have been made based on fertile soils and availability of grain and vegetables. Over time, as the population grew and cities boomed all over the globe, produce no longer remained specific to a region. In fact “in the process, we systematically fragmented most of the world’s terrestrial biomes, rearranging the lives of countless assemblages of plants and animals.”² Similarly, as crops relocated, they found that they were far more dependent on human intervention; however with artificial selection, crop also grew larger.

Baltimore was primarily founded for its location to the waters edge - a port city designed for sea trade. Looking back to Baltimore’s founding years in the mid 1700’s however, one can track the incoming arterial roads of the city - those responsible for bringing food from the agricultural land, into the urban center. Today, many of those “wagon roads” of the past remain large vehicular streets in and out of the city core - often diagonal that break the orthogonal grid.



[Figure 29] Mapping Baltimore’s growth

1 Despommier, Dr. Dickson. *The Vertical Farm: Feeding the World in the 21st Century*. New York: Thomas Dunne Books, 2010 p45
2 Ibid. p49

DEMOGRAPHICS

[environmental justice] equitable spatial distribution of burdens and benefits to groups such as racial minorities, residents of economically disadvantaged areas, or residents of developing areas.

A mixed income, postindustrial city, Baltimore is a strong example of an American city that generates physical output as well as creative thinking in many fields. Unfortunately it is also an example of strong social, economic, and environmental injustice issues that infest many depressed urban neighborhoods in cities such as Baltimore. There are a number of sociocultural issues tied to the rapid expansion of human population and settlement; postindustrial urban communities are one of the most common typologies in which the built environment is a clear consequence of such social issues. In Baltimore, the urban landscape has become a patchwork of prosperous and perilous communities, in which the two coexist throughout the city. While some neighborhoods are in a state of growth and positive expansion, others are neglected, leaving behind scarcely occupied architectural carcasses and vacant lots in the center of highly populated urban districts.

While actions are being taken by organizations such as the Baltimore Development Corporation and the Baltimore Planning Department, too much of the built urban context is in a state of failure to rely on political, or any form of external intervention. Rather, communities must be provided with the resources and knowledge to problem solve at the scale of which they exist - i.e the neighborhood. As a result of our current monocultural attitude, Baltimore displays a number of urban symptoms which outline an unsustainable city.

While the number of households in Baltimore City earning less than \$25,000 per year has decreased by almost 10% over the past decade, over 32% of households still fall under the 25K line.³ Slightly over half the population between the ages of 16 and 64 are employed, which means that a significant portion of the city's population is not earning

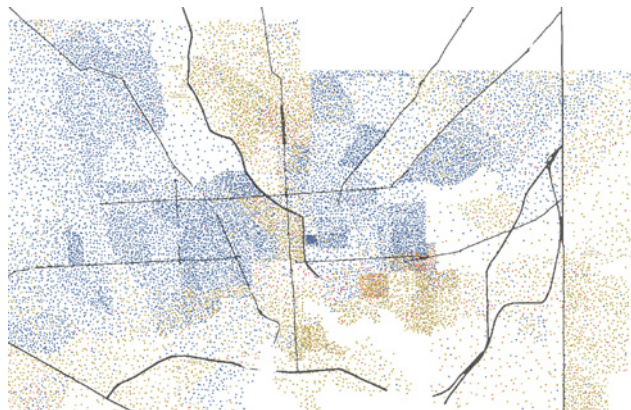
3 "Mapping the US 2010 census data" New York Times. Web < <http://projects.nytimes.com/census/2010/map?hp>>

enough to own vehicles or pay for unsubsidized products.

Looking at formal education levels throughout the city, approximately 82% of the population over 25 years of ages has completed a high school education or higher. In some neighborhoods, the percent of high school completion is as low as 40%, reciprocally identifying neighborhoods with high crime rates and lack of community standing.⁴

Baltimore has one of the highest densities of African Americans in the US – almost 65%. Majora Carter, an environmental justice advocate for the South Bronx and founder of the non-profit organizations “Sustainable South Brox” and “Greening the Ghetto”, makes the claim that an African American living in an American city is twice as likely than a white resident to live somewhere where air pollution poses the greatest health risk. She also states that African Americans are five times as likely to live within walking distance of a power plant or coal facility.⁵ While the site for this thesis may not conform to either of these statistics, it fuels the arguments that Black Americans often inhabit more hostile urban environments. In connection, the notion of food deserts in the city directly corresponds to other health conditions such as those address by Majora Carter.

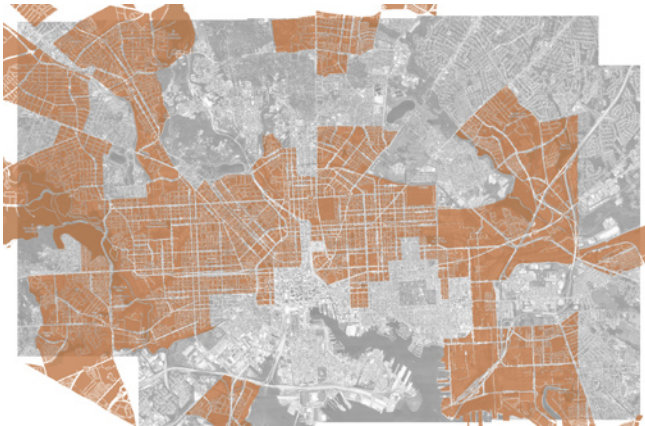
In addition to issues of education and poverty, many American cities are facing severe challenges of how to sustainably and healthily feed their cities. Baltimore is scattered with food deserts, which leave pedestrian based neighborhoods with little or no access to fresh foods and few transportation options to reach them.



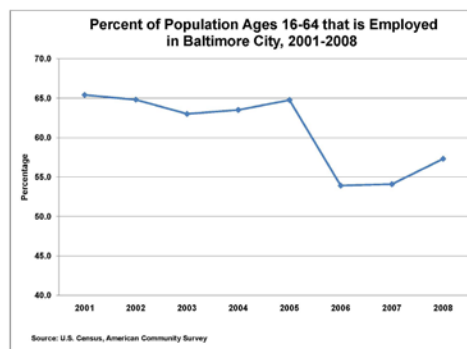
[Figure 32] Map of Baltimore indicating racial ethnicities

4 Ibid.

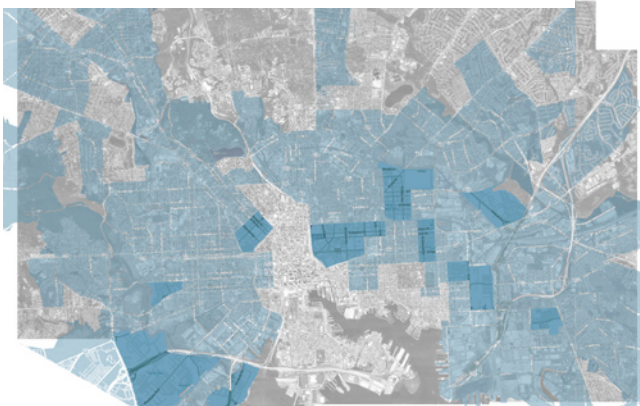
5 Carter, Majora. “Greening the Ghetto”. TED Talk. Web < http://www.ted.com/talks/lang/en/majora_carter_s_tale_of_urban_renewal.html>



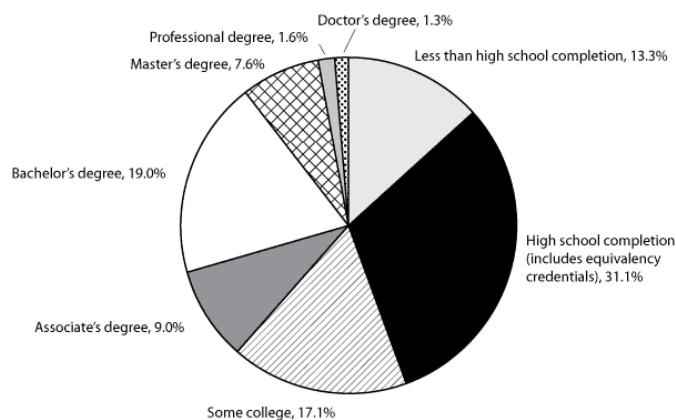
[Figure 33] Map of Baltimore indicating areas where 40% or more households make less than 30k per year



[Figure 34] Table indicating the percent of population unemployed



[Figure 35] Map of Baltimore indicating areas where less than 80% of the population graduated high school [darker areas indicated less than 60%]



[Figure 36] Chart indicating levels of education in Baltimore population

FOOD SYSTEMS OR LACK THERE OF

[FOOD DESERT] a district with little or no access to food needed to maintain a healthy diet; an area where food is non-existent, not healthy, or too expensive

While these demographics play a role in identifying an urban neighborhood suitable for an architectural intervention which engages these social, economic and educational issues, the prominent mapping relevant to this thesis is food systems – including production, access, storage, and distribution within the city. According to a study conducted by MSNBC last year, out of the 630,000 residents that live in Baltimore, almost 1/5 have little or no access to fresh foods; consequently approximately 2/3 of all adults and 1/2 of all high school students suffer from obesity.⁶

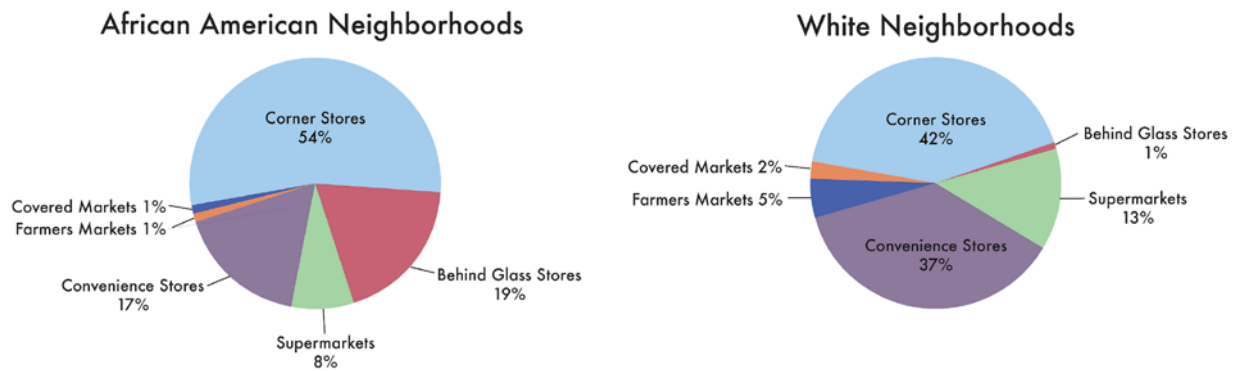
While most large-scale grocery stores are scarce in urban environments, the majority of Baltimore's available food stores are convenient or corner stores which rarely supply fresh produce. At this scale, these building typologies are a product of their environment; meaning that if the neighborhood is in a state of disrepair, as is the store and the availability of food. A large number of studies reveal that disparities in healthy food access are a primary cause of racial health differentials, which builds on the negative relationship between food and low-income neighborhoods

Locating where in the city one can purchase a hot dog versus a head of lettuce is a simple task, however it is a near impossible task to trace the origins and transit path of how that food came to be on the shelf. At the Johns Hopkins School of Public Health, the Center for a Livable Future (CLF) has been working to understand the current food supply system within the city. Interacting at three primary levels: research, educational outreach, and community action, the CLF views food systems as a primary contributor to the overall ability for a city such as Baltimore to sustain itself.⁷

Contributing factors that designate urban areas as food deserts, range from

6 Nuckols, Ben. "Missing: Fresh Foods in Baltimore." MSNBC, 7 Jul 2010. Web. 16 Mar 2011. <http://www.msnbc.msn.com/id/38132706/ns/health-diet_and_nutrition/t/missing-fresh-foods-baltimore>
7 Johns Hopkins University: Center for a Livable Future. Web. <<http://www.jhsph.edu/clf>>

vehicular ownership, to economic standing and opportunities for growth, to population density and racial majorities. The notion of public transit and car ownership plays a crucial role in identifying neighborhoods that struggle with gaining access to foods; it also is a key element in recognizing sites that would receive a solution to this problem in an applicable form. Where does it make sense to intervene with large or small-scale grocery, market or food distribution hubs? At first, the initiatives toward producing food within the city will be located on inexpensive land plots, which are usually identified in poor neighborhoods.⁸

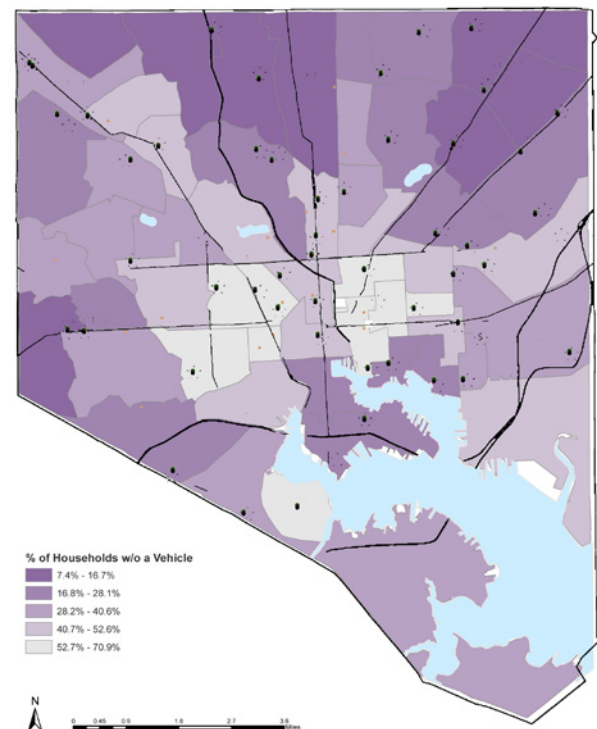
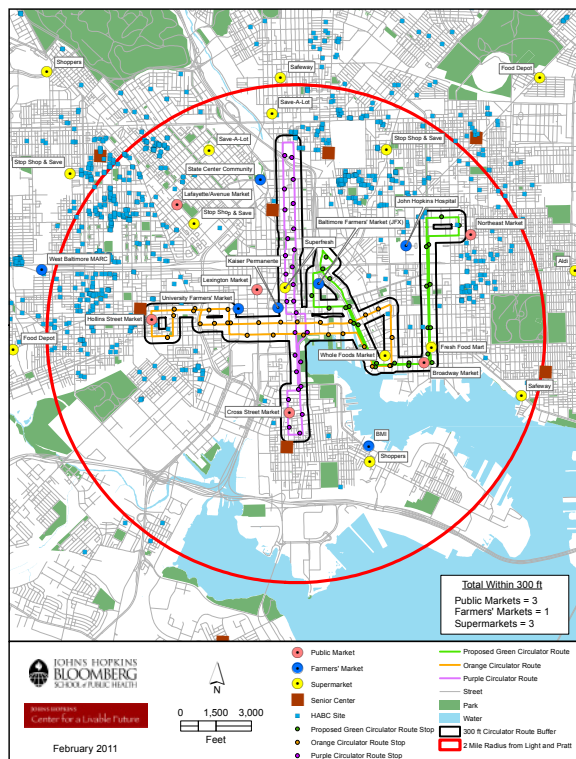
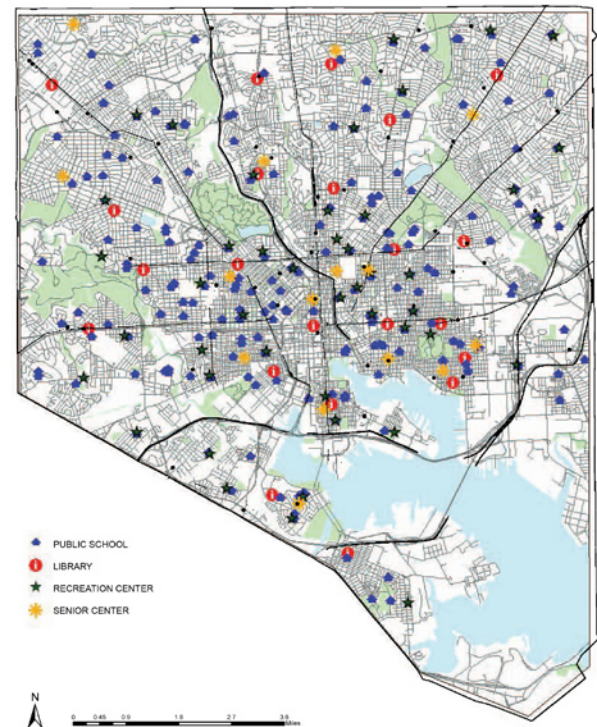
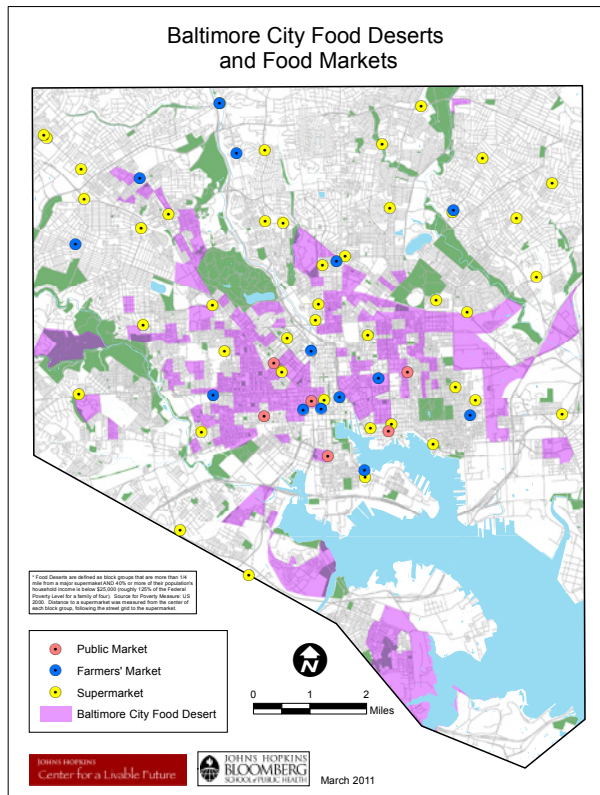


[Figure 37] Food retail typology break down in Baltimore based on ethnic distribution



[Figure 38] Examples of existing food retail in Baltimore

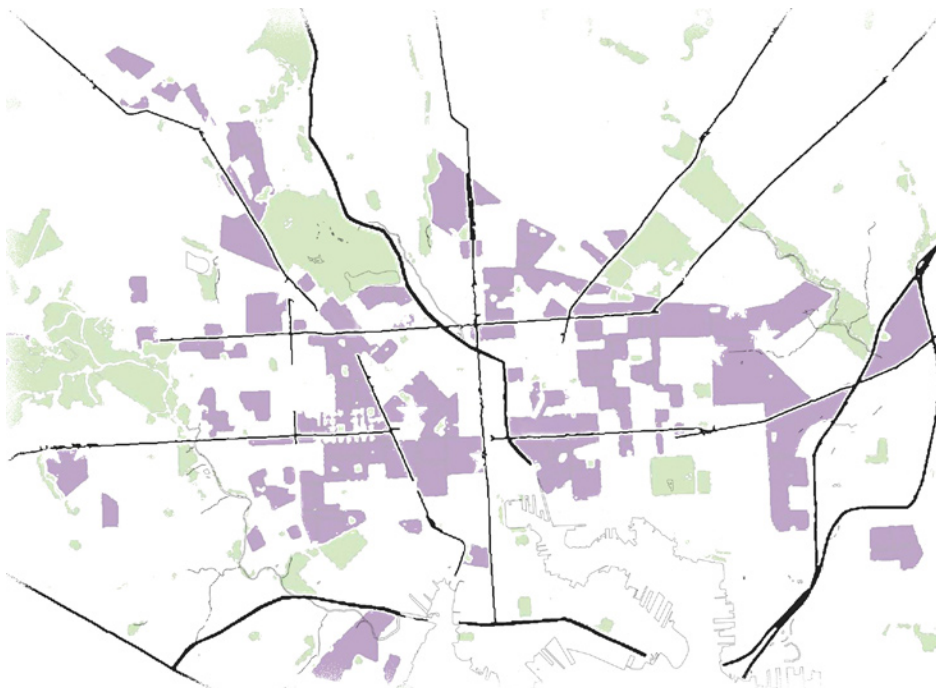
8 Despommier, Dr. Dickson. *The Vertical Farm: Feeding the World in the 21st Century*. New York: Thomas Dunne Books, 2010 p xiii



[Figure 39] Diagrams from the JH Center for Livable Future



[Figure 40] Map of Baltimore indicating existing green spaces



[Figure 41] Map of Baltimore indicating all areas [purple] designated as “food deserts” by the John’s Hopkins Center for a Livable Future

THE BALTIMORE VERNACULAR

Considerations toward regionalism and vernacular building methods are not only a stylistic rendition, but also an approach toward design which acts to address the cultural values or needs of a region's inhabitants. It is simple to assume the regional characteristics of rural, tribal, or developing areas that are often limited to certain building methodologies; however if one is to "reconsider regionalism from the point of view of the social process of place making, a multiplicity of cultural identities, issues of climatic response, and effects of social change"⁹ the principles of designing regionally are just as applicable in an urban context. The layering of social and cultural experiences founded from the premises of a postindustrial city such as Baltimore, are a regional qualification in their own.

The notion of interactive space as realized in historic and contemporary market places is a way to interpret architecture as a regional and social act. Responding to the city's primal conditions of exchanging goods, distributing food, and sharing knowledge, the market place is the quintessential hub for the functioning city.

Baltimore has a rich history of public markets; its food market system is the oldest in the nation and is still a prominent feature within the city. In 1763, the city's first public food market was opened on the corner of Gay Street and Baltimore Street. Over the subsequent two centuries, eleven more markets were established, serving as the primary source of food for the city as well as generating a center for urban society. Today, six markets remain (4 of the original eleven): Lexington Market, Northeast Market, Cross Street Market, Avenue Market, Hollins Market and Broadway Market. While the character of the markets has changed significantly over the past few centuries, they remain "a significant institution that reflects the past and future character of the City's neighborhoods."¹⁰

9 Heath, Kingston. *Vernacular Architecture and Regional Design: Cultural Process and Environmental Response*. Oxford: Elsevier Architectural Press, 2009 p xiii

10 Sharan, Mallika. "Baltimore Public Markets Corporation." Web. <<http://www.bpmarkets.com>>

In the past few years the establishment of local farmers markets and private vegetable gardens has been on the rise, creating a foundation and ample opportunity to continue the initiative to rework food systems through design within the built environment.

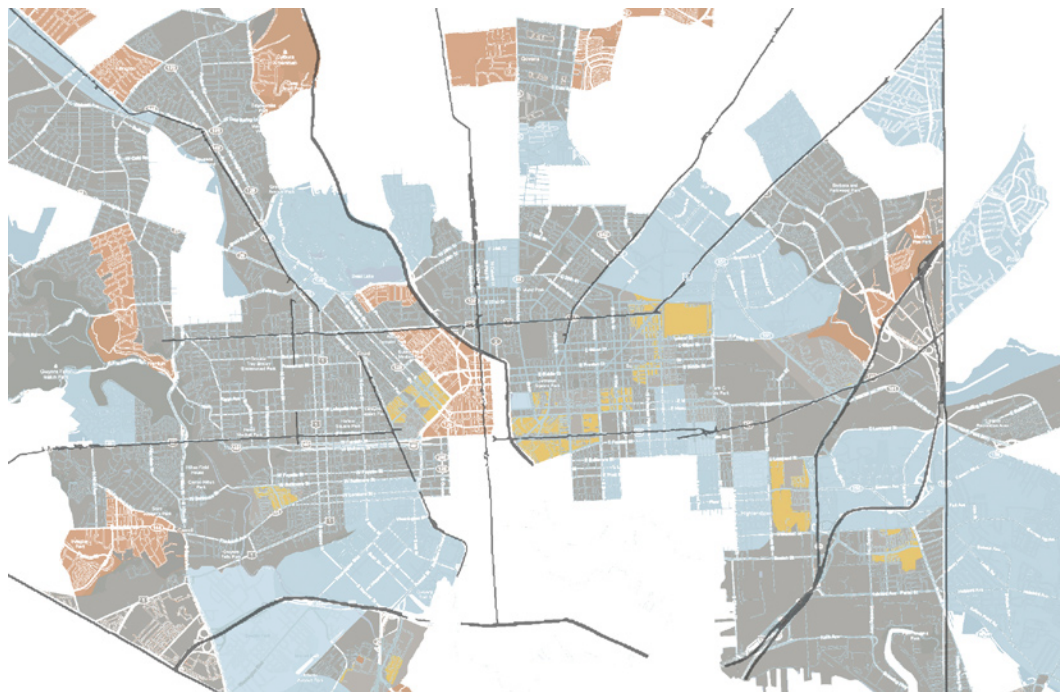


[Figure 42] Photos of Baltimore Markets in the 20th century

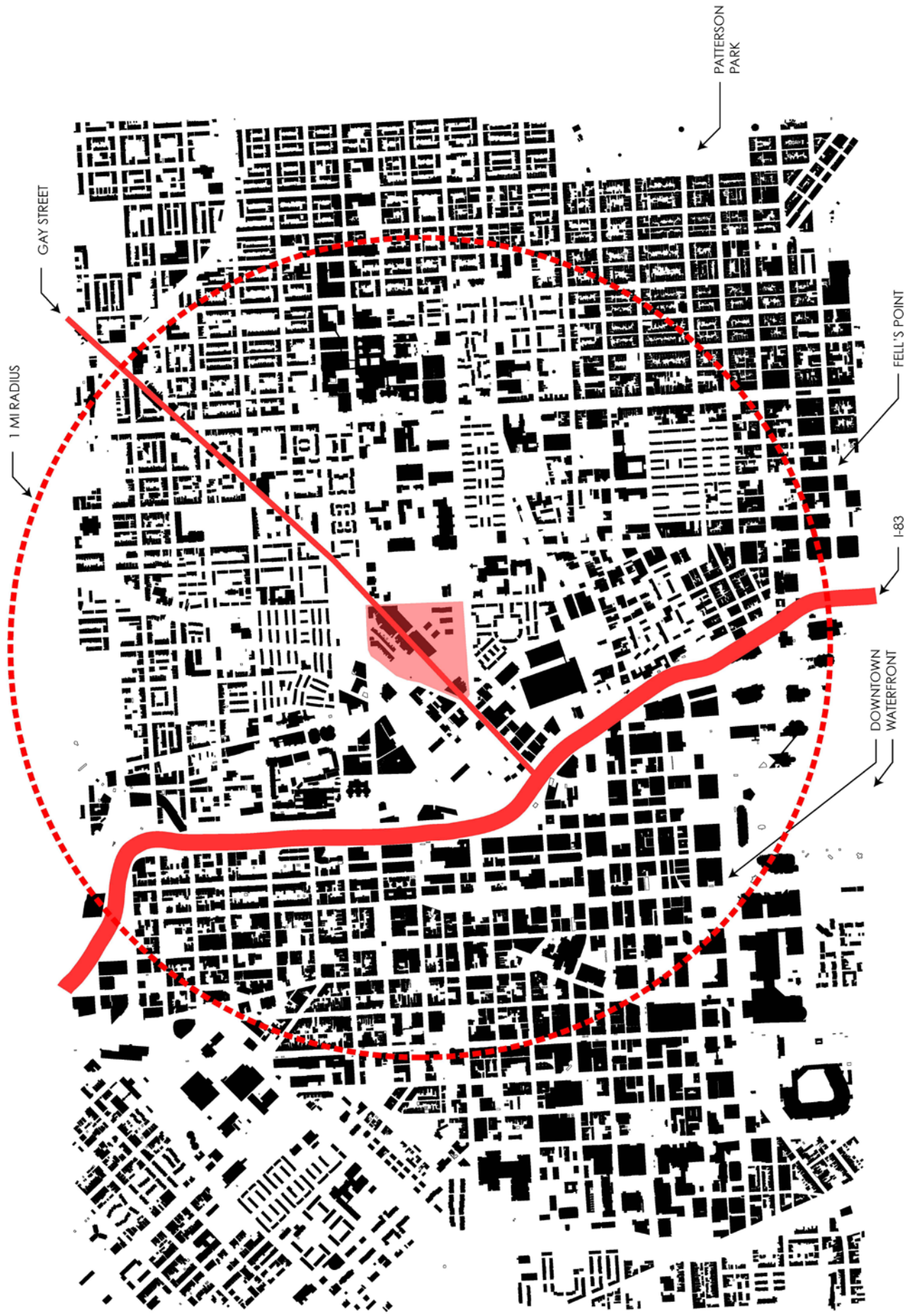
OLD TOWN MALL

Baltimore city is inhabited by countless neglected spaces visible in two forms – depressed architecture and residual spaces between existing architecture. Reclaiming these is the first step in revitalizing blighted social realms and also the first place to look for available site for possible urban agriculture. In choosing a site for this thesis, identifying areas within Baltimore that encompass a number of both architectural and sociocultural issues was the first step; lower-income, lower education levels, an absence of healthy food supply, and a general lack of resources that enable the community. Juxtaposing the demographic and statistical mappings, each site was identified by the layering of social, economic, educational, and agricultural starvation.

One site, a previous location of one of the original eleven Baltimore markets, contains particular intrigue due to its relative connection and yet disjointed nature from the city center – the Old Town Mall located between E Monument Street to the north and Orleans Street to the South. This vacant property sits in a primarily institutional district, with a series of supporting transit routes nearby.



[Figure 43] Map of Baltimore layering food deserts, low education, and low income



[Figure 44] Figure ground of Baltimore locating Old Town Mall, Gay Street and I-83

Originally the site of a pedestrian based market strip, this under utilized lot bares a series of historic, spatial and programmatic connections to the city. Until the 1930s when a fire made a final end of it, the old town mall was home to Belair Market. This market, which spanned 285 feet in length (65 feet wide), was known for large weekend markets when farmers from outside the city limits would bring food in along what is now know as Gay Street - “one of the early turnpikes that fanned out like the spokes of a wheel connecting the city to the surrounding counties”.¹¹ As an extension of Gay street, which transforms into the diagonal pedestrian promenade on the site, this 20 acre block is the single point of connection within the urban plan between Northeast Baltimore and downtown. Originally a thriving commercial district, the Old Town Mall was separated from the city core by the construction of interstate 83, a road artery that slices the urban fabric and consequently divides the density and activity of the city.

Old Town Mall is one of few residual spaces in the city of this scale and in this proximity to Downtown, Fells Point, Patterson Park, and the Baltimore waterfront. Relatively open and low in density, the open space on the block is frequently utilized as a place for social gathering, or transient space to move between neighborhoods or access circulator routes located just to the west of the site. Orleans Street (south boundary of site) and the surrounding area is substantially composed of institutional and civic architecture such as the Orleans Pratt Library, JHS Hospital & School for Public Health, as well as multiple high schools, elementary schools and other academic academies. These contextual programs are a foundation for the site plan as developed in this thesis. Appropriately responding to these programmatic edges is crucial to surgically embedding an intervention of this scale and scope.

Today, although the site’s infrastructure has slowly deteriorated over the past two decades, the surrounding area is expanding in population through the development of mixed-use (residential & commercial) neighborhoods. Many of the residential

11 “Baltimore Municipal Markets” Web: < <http://www.baltimoremd.com/arabber/baltmars.html>>

developments allocate the majority of units to lower income dwellers. A hope 6 housing project is located on the southern edge of the site, inspiring the development of many more neighborhoods since the 1990s. With a population of almost 12,000 in the immediate surrounding area, the site is also positioned just two to four blocks in either direction from major bus routes and metro stations.



[Figure 45] Postcard image of historic Belair market at Old Town Mall



[Figure 46] Photo of Old Town Mall vacant space with fire tower in background



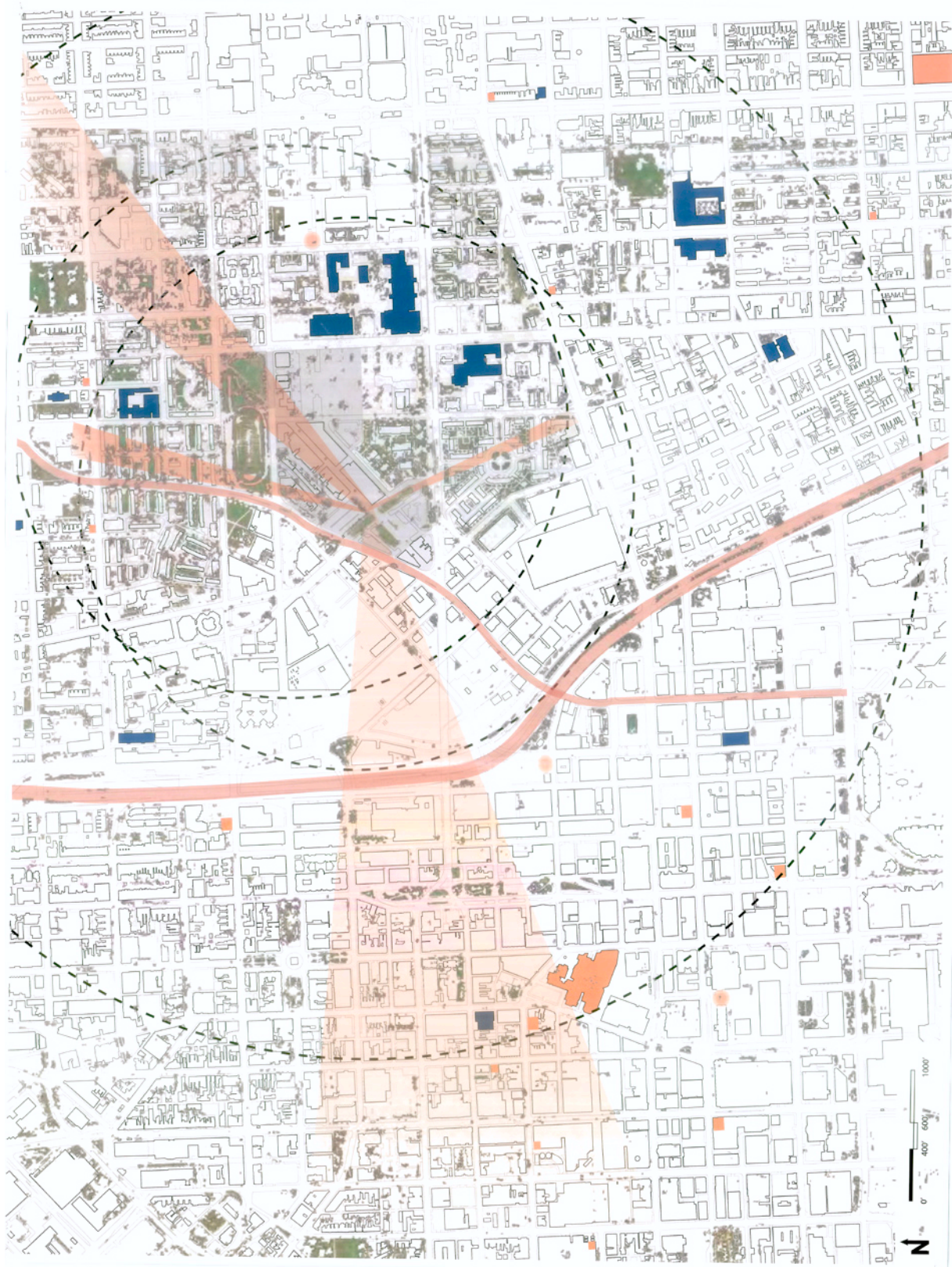
[Figure 47] Figure ground map locating food retail as it relates to Old Town Mall site



[Figure 48] Panoramic photo of Old Town Mall looking south



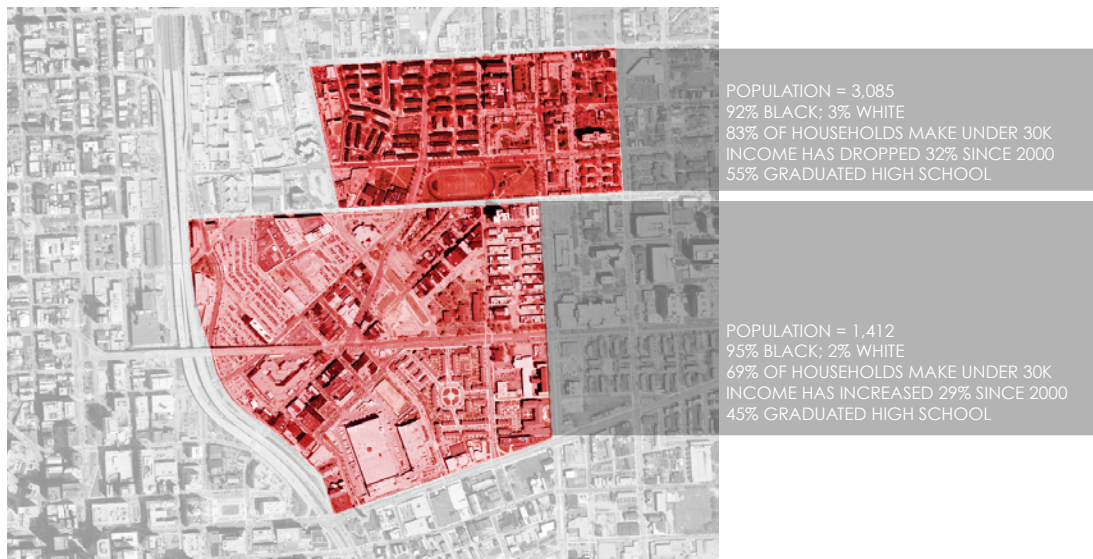
[Figure 49] Panoramic photo of Old Town Mall looking west



[Figure 50] Site analysis diagram



[Figure 51] Transit mapping locating bus routes and metro in context of site

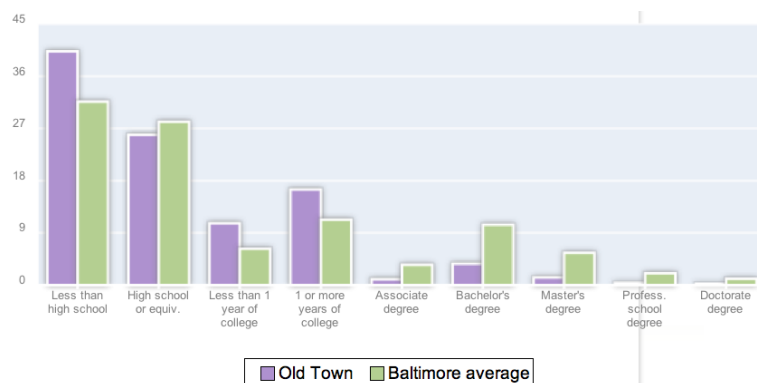


[Figure 52] 2008 census data for Old Town Mall and surrounding neighborhood



[Figure 53] 2010 census data for Old Town Mall and surrounding neighborhood

Educational Attainment (%)

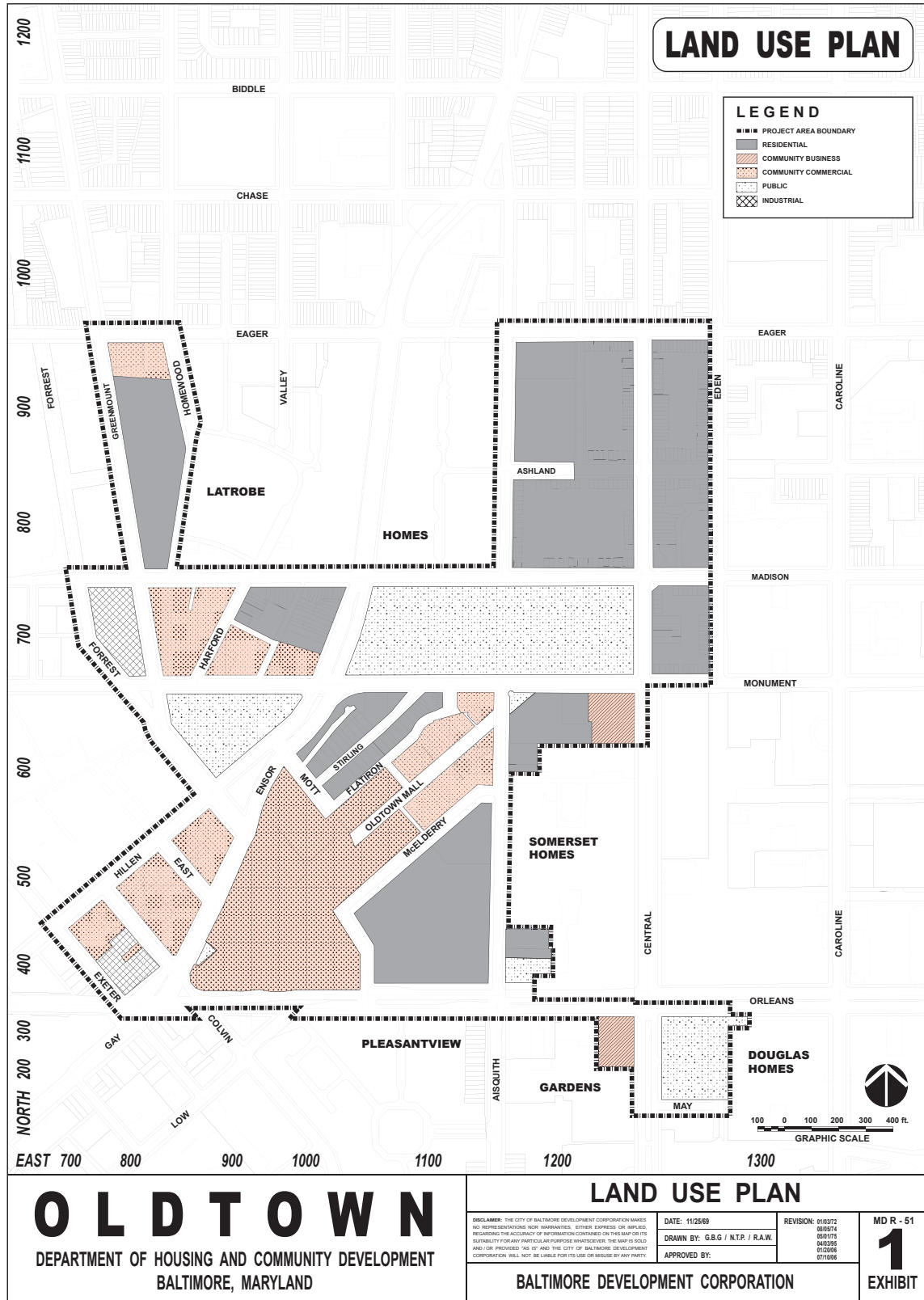


[Figure 54] Table comparing education levels between Old Town Mall and Baltimore City

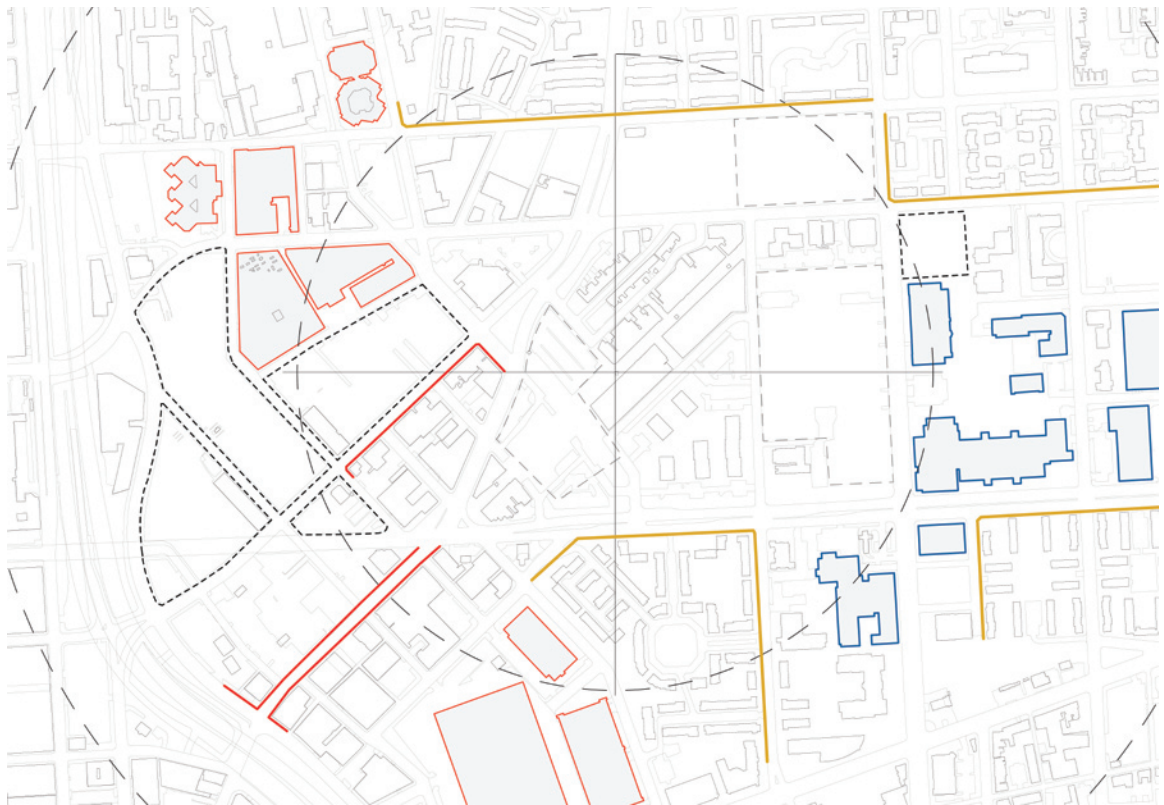
The Baltimore Development Corporation has been involved with the potential redevelopment plan for the site; hosting a design competition in 2003 and continuing to outline renewal ideas up until 2006. The original, 1970, mixed-use proposal aimed to revitalize the area through commercial retail and multifamily housing. A series of the objectives stated in the plan are 1) “To remove and or rehabilitate substandard buildings and to eliminate blighting influences” and 2) “To provide land for open space, recreation areas, educational and other public facilities.” Today, the addendums do not specify the programmatic intent for these “educational and public facilities,” however given the site parameters, scale, context and location, an extremely strong framework for incorporating civic architecture that services the city is posed.¹²

Contextually juxtaposed between growing residential neighborhoods, three public schools, I-83, the center of the city, and a number of public institutional and civic buildings, the site offers ample opportunity to focus in a bounded area and yet effectively stretch to a substantially larger context of the city. The open space within Old Town Mall is also a strong opportunity for connecting a series of spatial nodes within the neighborhood. A community park culminates the diagonal at the northeast corner, while commuter parking lots and a centrally focused residential development create a nexus of connections back to city life. While Gay Street directionally binds the northeast city to the center, Old Town Mall is currently a dead end; however reexamining the potential to grow off this existing axis and reorienting the site back to the city could aid the revitalization efforts in progress.

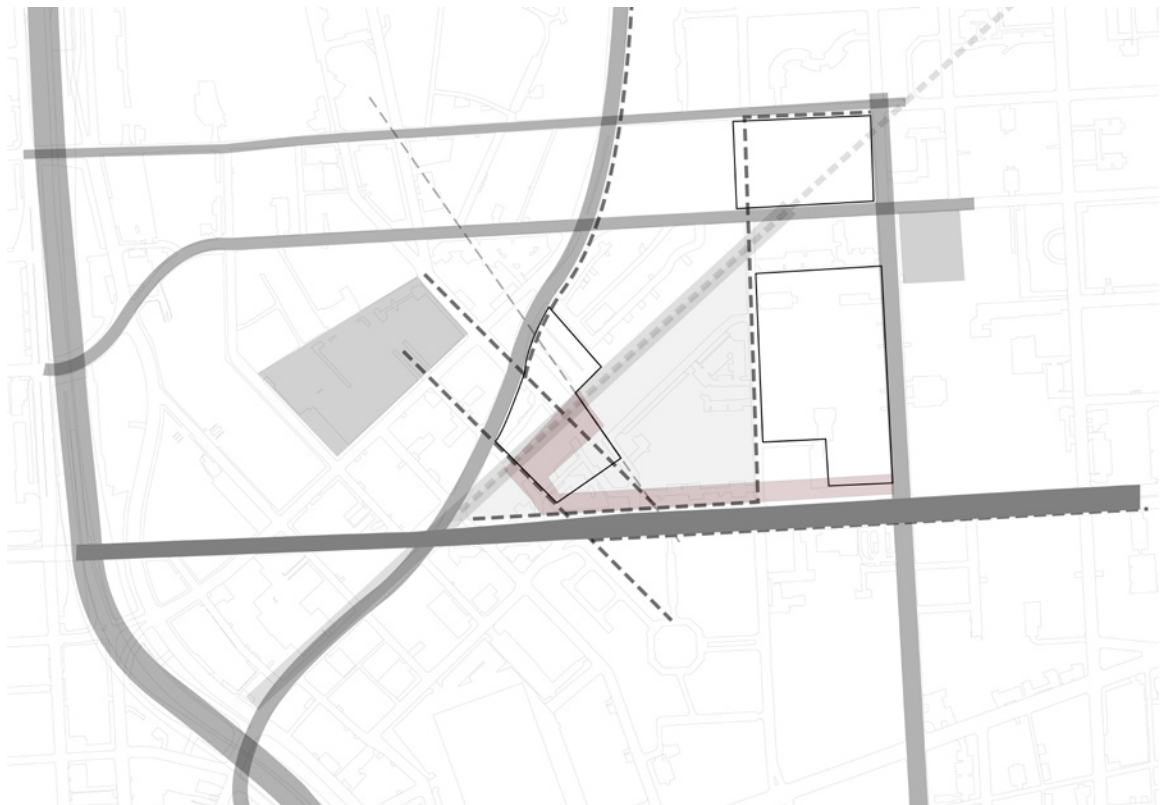
12 “Urban Renewal Plan: Oldtown.” Web: <http://www.baltimoredevelopment.com/sites/default/files/downloads-resources/Oldtown_Mall_URP_low_res.pdf>



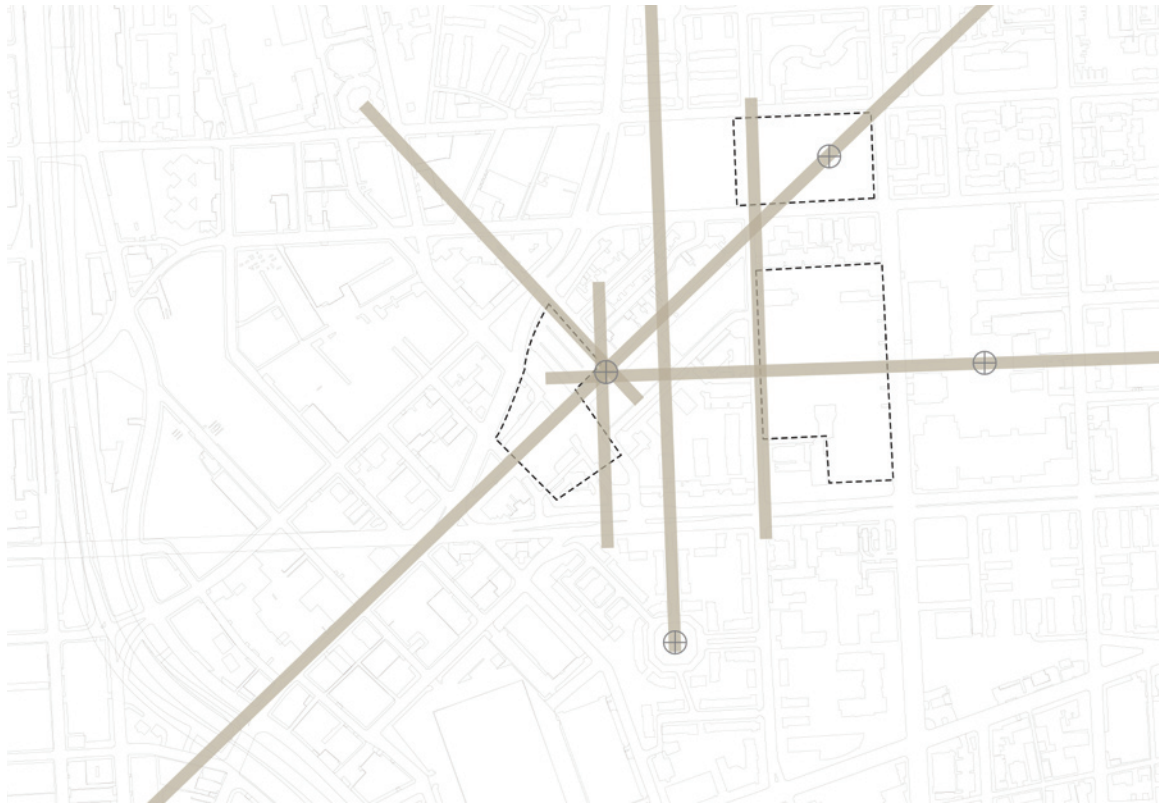
[Figure 55] Land use plan for Old Town Mall



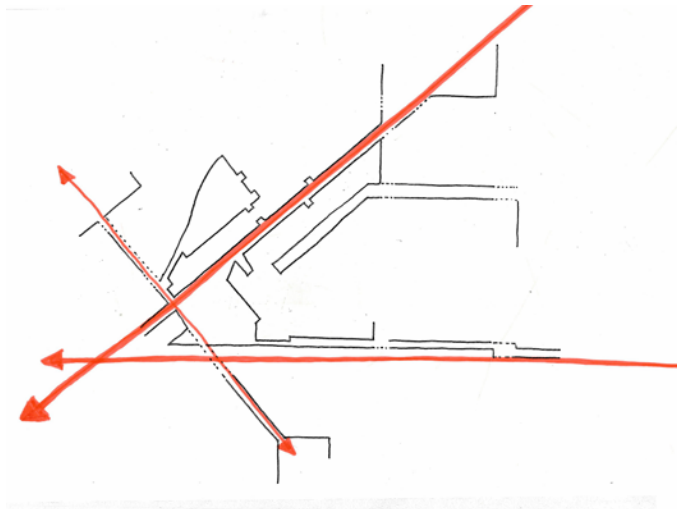
[Figure 56] Site analysis diagram of contextual programming



[Figure 57] Site analysis diagram of potential movement nexus



[Figure 58] Site analysis diagram of connecting neighborhood centers



[Figure 59] Diagram of tri-axial relationship between city and site



[Figure 60] Figure ground of building form and its contextual relationships



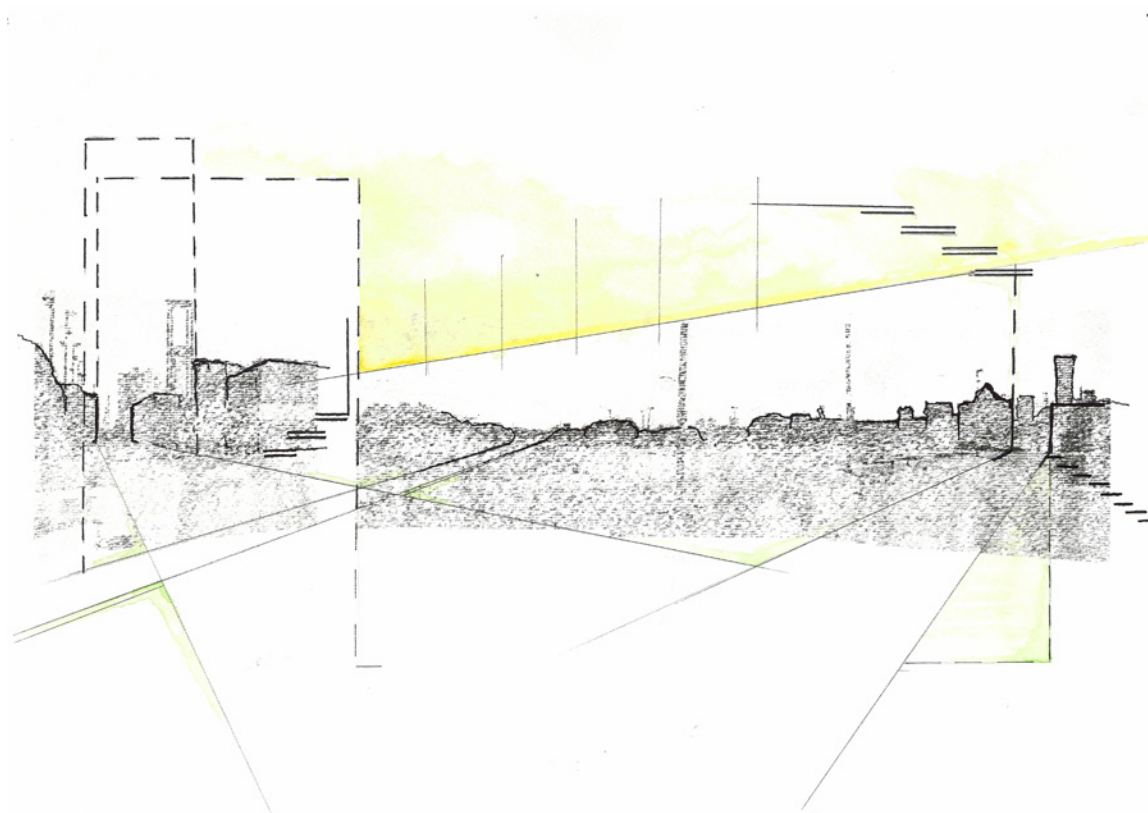
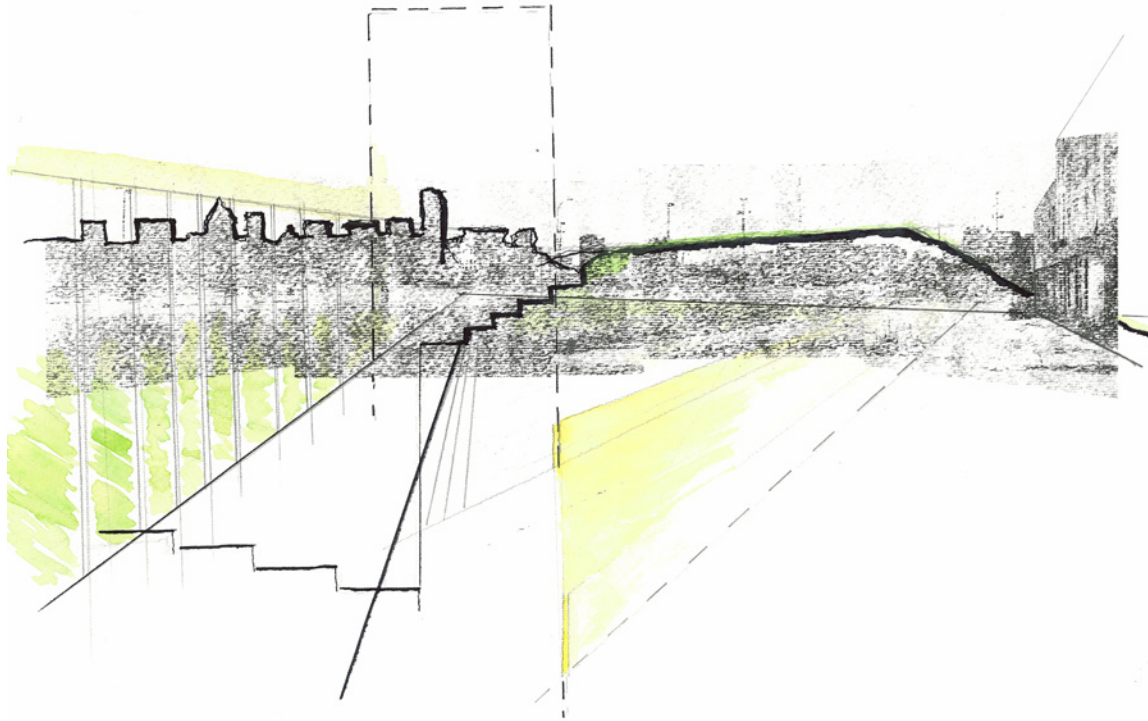
[Figure 61] Concept study models of “intersection”, “overlap”, “joint”

SITE STRATEGIES

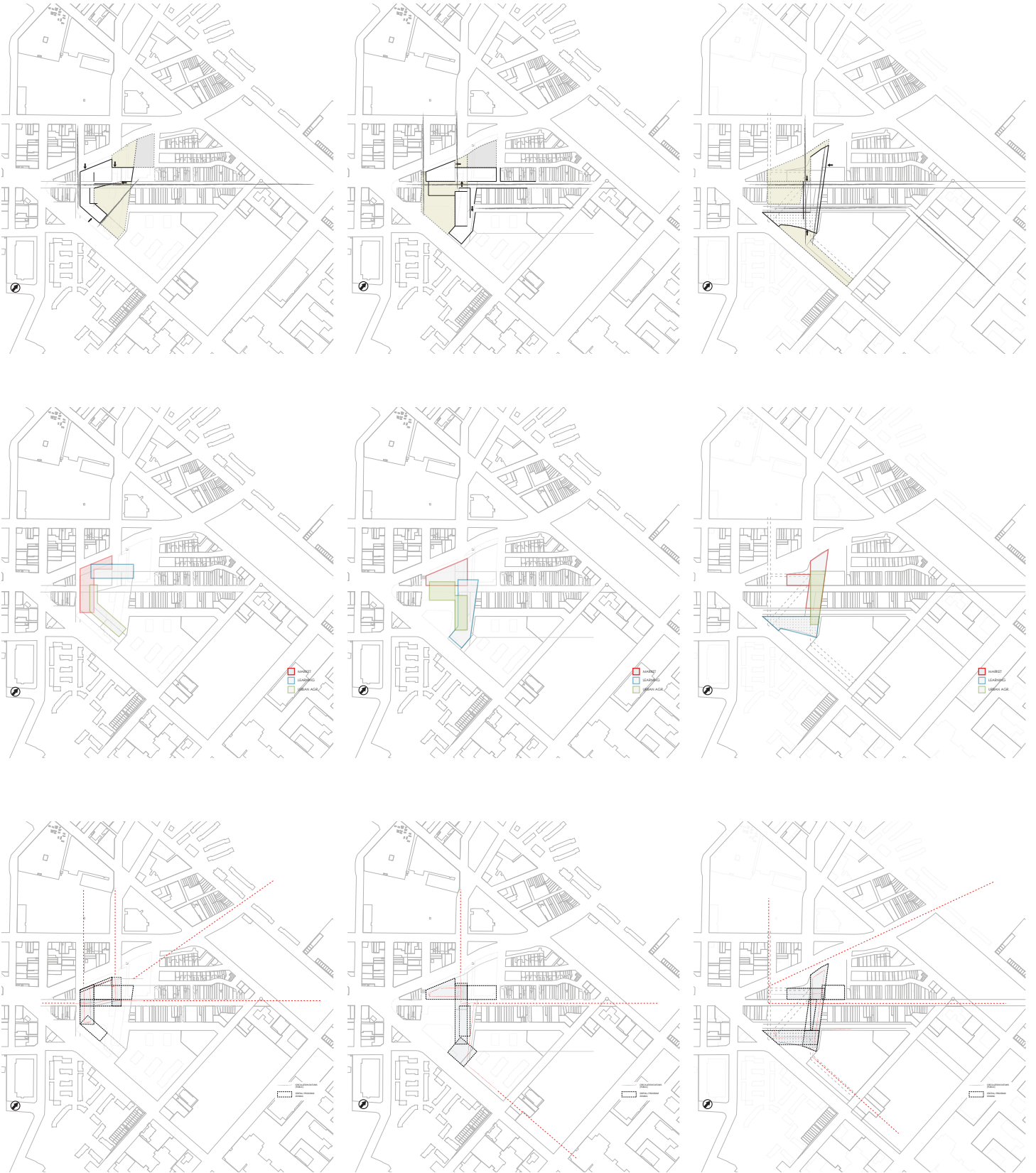
The integration of programs on the site yields a unique urban condition using two built forms to both frame a public market plaza as well as open up to Orleans Street on the southern edge. The orientation of the site, as well as the inward focus of surrounding retail buildings presents a series of challenges - the main one being that the site has five fronts. The market building, which follows the curving edge on the north side of the site, has a front along Ensor (curving street) and along Gay Street (internal pedestrian street) - creating unique opportunities for movement and facades, while also presenting challenges for building service. The greenhouse building on the other hand, rotates to create a single front towards downtown.

Playing off existing geometries and solar exposure, both buildings work to frame a constructed landscape. This plaza space is accented by an elevated surface which creates a spatial separation between a portion of the plaza closest to the market - a occupiable extension of the marketplace - and the space which acts as a buffer from the chaos of Orleans Street. This plaza space, occupied seasonally, also focuses the greenhouse back toward downtown - generating vistas that emphasize the connection between growing and the urban environment. This juxtaposition between program and city form is, in itself, a learning tool for urban dwellers.

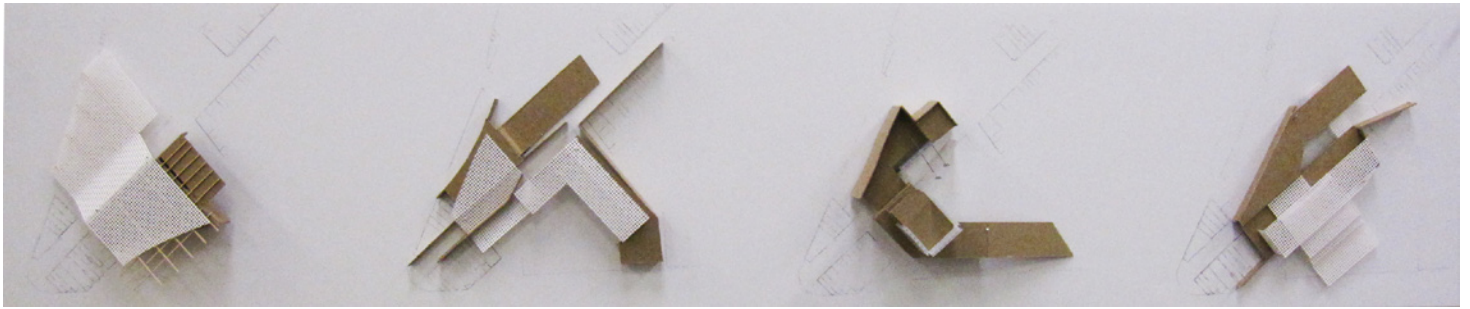
Situated in an urban context where the physical organization of the city dissolves between the grid to the east and grid of downtown, the site proposal is an unconventional solution to unconventional urbanism. Its physical forms represent a triad of spatial programming that allows for free movement while also creating an outdoor component to this urban anchor - ultimately emphasizing the interplay between urban life and public space. Old Town Mall has always been a site that focuses on the procession through retail. Previously its configuration reflected a linear understanding (like the current food system). By designing open space that intersects social exchange and produce markets, the site becomes a dynamic hub for interaction.



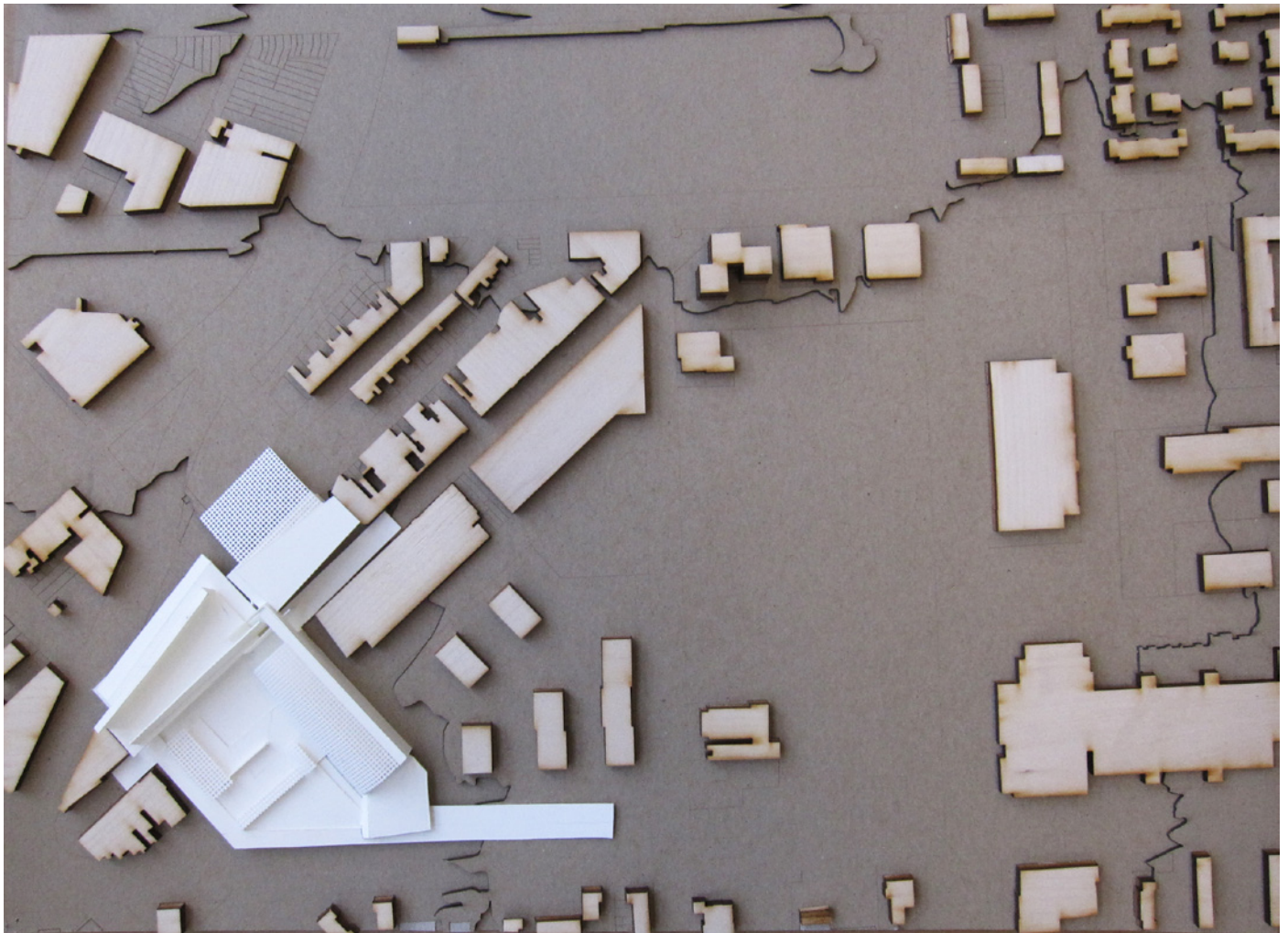
[Figure 62] Concept collages representing connections between site and downtown



[Figure 63] Site schemes studies



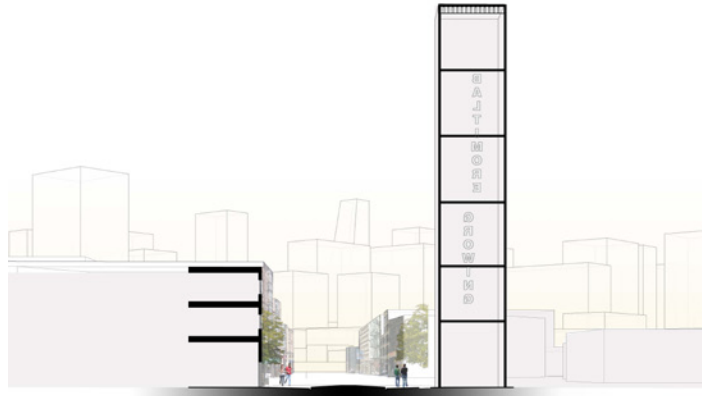
[Figure 64] Site schemes model studies



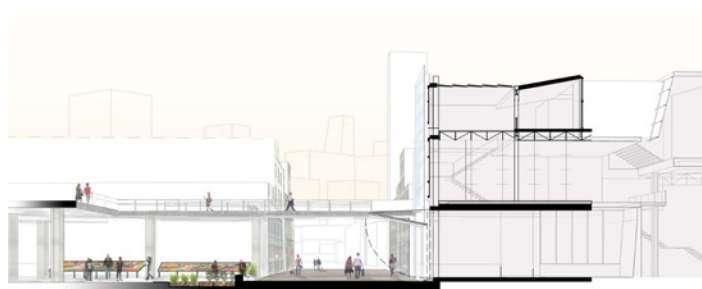
[Figure 65] Site model study



[Figure 66] Site plan



EE



DD



CC



BB



AA

[Figure 67] Sections perspectives portraying different experiences and spatial conditions of enclosure down the pedestrian promenade of Old Town Mall

CLIMATE & YIELDS

One of the largest contributors in understanding and working with the cyclic nature of food supply systems is climate conditions and the ability to extend seasons to continue food growth throughout all times of the year, not just those ideal for particular crops. Prior to technologies, which made season extension, indoor irrigation systems and artificial day-lighting possible, communities were dependent on the climate conditions of their region.

Baltimore is part of the humid subtropical climate zone, which means its moderate temperatures are combined with high humidity and relatively ample rainfall – approximately 45 inches each year. In Baltimore, first frost usually occurs the last few days of October and the average last frost is mid-April, allowing a growing season of around 200 days.¹³ Located at a latitude of 39 degrees north of the equator, Baltimore receives over 14 hours of day light at the summer solstice – with a sun angle of approximately 74° - and around 9.5 hours of daylight at the winter solstice – with a sun angle of 37°.

This thesis, as well as an architectural intervention within the Old Town Mall site, proposes two large scale open agricultural fields on the open lots adjacent to the site. The two lots - 5 acres and 9.5 acres - are both a demonstrational learning tool for Baltimore, as well as production landscapes. Situated next to the surrounding school, just two blocks from John's Hopkins Medical center the fields are capable of producing significant amounts of crop yield. For example, on the 9.5 acre plot alone, one could annually grow:

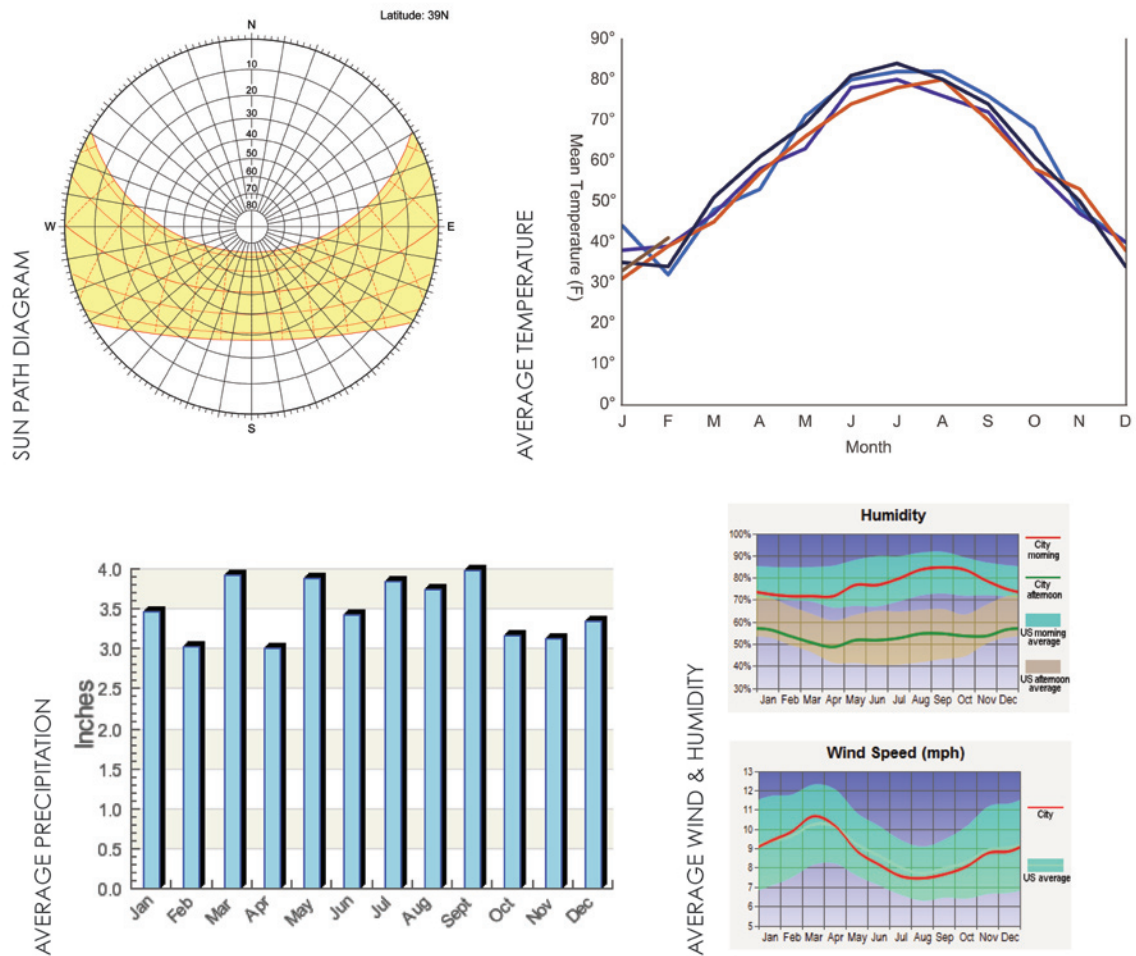
104,500 lbs of tomatoes (which at 24lbs per crate yields 4,355 crates)

144,400 lbs of Irish potatoes

184,300 lbs of carrots

These crops along with corn, soybeans, and wheat are some of the most well grown in the Maryland climate.

13 "2011 Best Planting Dates for Seeds for Baltimore, Maryland." The Old Farm's Almanac. Web. 16 May 2011. <<http://www.almanac.com/gardening/planting-dates/MD/Baltimore>>



[Figure 68] Baltimore climate analysis



[Figure 69] Size of proposed urban agricultural fields

05. DESIGNED EXPERIENCE

“In Europe, in a restaurant, you order a fish and what comes to the table is the whole fish with the head still on: its staring at you! In the US you rarely get that.

I know people that would not eat a whole fish if they saw it. My response is:

‘Where do you think you dinner comes from?’”

- Christine DeBrot

CHALLENGING PRECONCEPTIONS

Using the cyclic nature of food processes – from seed, to soil, to produce, through distribution, consumption and its eventual return as compost and fertilization – as design inspiration, the architecture of this thesis is intended as a cycling organization of spaces; one which juxtaposes moments of transition with nodes of pause which ultimately helps to reprogram and stitch the ailing site. By interpreting the possibilities and limitations of architecture in the same manner that one understands the necessary conditions for natural growth gives an immediate framework for inhabitable design to be established.

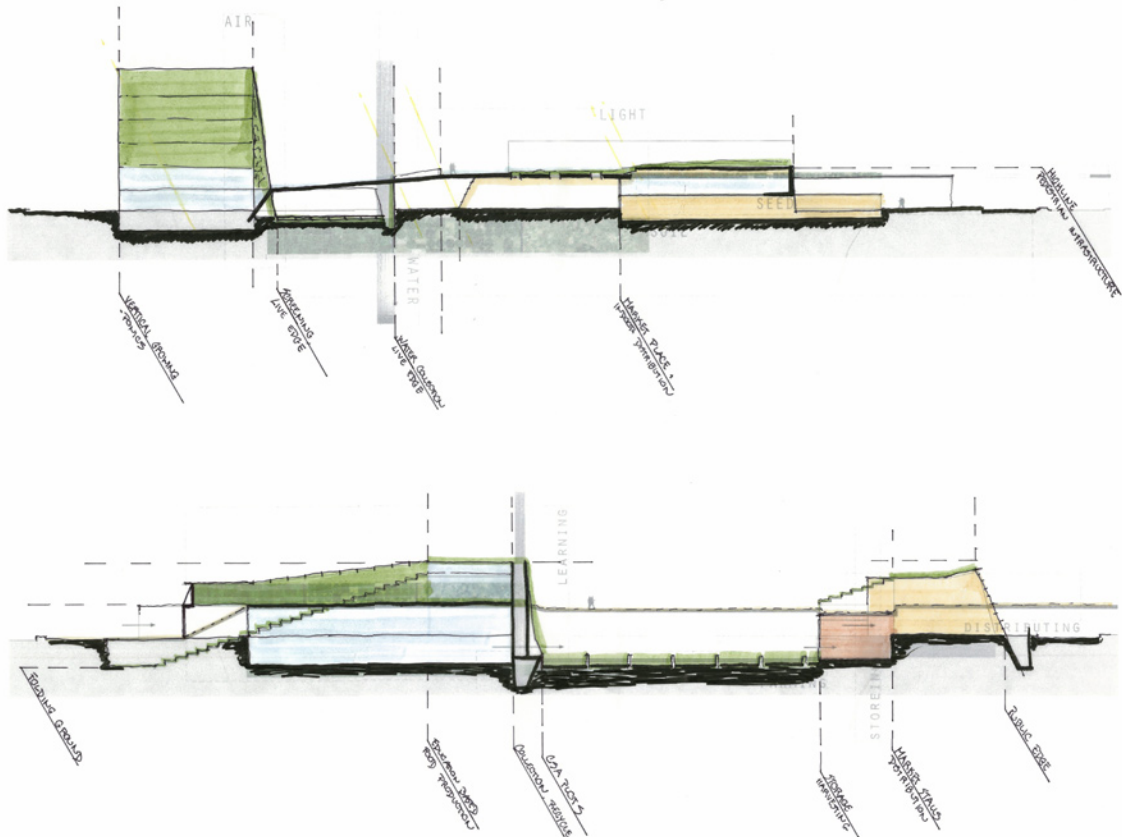
In addition, the relationship between the ground condition and the overhead becomes of extreme importance as one imagines the connection between soil and sun. This void that one inhabits is the interstitial space that ultimately allows for plant growth and the creation of sheltered space. By nature, a building interrupts this plenum.

In traditional farming, it is understood that the act of growing happens at the level of the ground - that harvesting occurs just above this - and that the display and sale of food happens at a height that responds to human form (levels of vision and reach). However, in truth many plants grow vertically; many grow from above, in hanging positions, and some grow completely submersed underground.

The first question in considering the architectural form of this thesis asked: how can this preconception be challenged in order to more intimately connect us with the true processes of growth, not solely the act of selling? The solution: to inverse the spatial relationship of this stratified experience so that the process of growing happens on all dimensional surfaces. This notion also offered more practical advantages. One of the largest concerns with urban farming is theft. By elevating growing surfaces, they render themselves inaccessible to the street public.

“Living” or “Eco” architecture, as practiced by architects such as Ken Yeang, attempts to mimicking the natural environment of plant growth through artificial built forms. This thesis reformulates this idea to also imagine using plant growth as

an inspiration for program. The inverse relationship of enclosure establishes a spatial condition in which to apply this. Similar to this thesis, Yeang practices “a vision of urban life that is reinforced by Nature.”¹ Visual, physically and experientially connecting the user to the spaces and surfaces in/on which produce can be grown and harvested - creates opportunities for learning that are not found in existing building programs.



[Figure 70] Concept sections illustrating notion of inverse growing and occupiable plenum space

This architecture, composed of flexible (or “growable”) spaces capable for change during in seasons, or evolution as the population expands, sheds new light on the notion of education through architecture. Green walls, crop fields, pervious surfaces and landscapes are the primary urban conditions. However, the architecture focuses on reinterpreting the linear marketplace into flexible spaces that fosters dynamic learning.

1 Hart, Sara. *Eco Architecture: The Work of Ken Yeang*. London: Wiley Publications, 2011 p8



[Figure 71] Experiential perspectives within the greenhouse spaces



[Figure 72] Site section through greenhouse and constructed landscape



[Figure 73] Experiential perspectives within the interior marketplace



[Figure 74] Site section through market building and constructed landscape

LEARNING THROUGH BUILT FORM

“Making school infrastructure literally transparent, to display the flows of water and waste, teaches us the workings of the real world.” - Christine De Brot

What is easy about learning is the complexity at which it occurs. What is difficult about learning is acquiring the environmental opportunity that fosters it. Architecture as a means of designing educational facilities is an age old concept - one that has exponentially progressed in the past century. As a tool for education, it provides spaces for learning to occur within. This thesis however, uses architecture as a tool for teaching itself. The built forms are designed to combine architectural functions of enclosure, lighting, materiality and circulation with process of food. It is this interplay that creates moments and experiences in which the occupation of architecture is a learning experience in itself.

One example of this is the sectional connection between water collection on site, water based vegetable production (aquaponics), and site users. Carving slightly into the ground, the architectural component that houses the primary greenhouse spaces uses grade change as an educational experience - not only does it create a funnel for storm water runoff on site, but also, through steps and transparent glazing, the architecture creates a visual threshold into food production that can be experienced year round.

A contrast between concrete at the base and light steel framing as the structural system for above, works to provide ample amounts of natural light into the building. At the core of the market building, a sloped trellis with inset glass panels serves three interconnected functions. The first, it is a structural connection between two separate built form on the second level; the second, a framework for vertical plant growth; and the third, as a source of both light and shade for the interior. In the warm growing months, squash - a hanging vegetable with large leaves for shading the fruit - fills the trellis - creating a shading device over the south facing glass. In the winter however, as the plant is dormant and the leaves are withered, this glass structure provided direct sunlight into the market - naturally warming the interior space.



[Figure 75] Experiential perspective of interior market edge; demonstrating architecture's role of creating a connective threshold between interior and exterior program adjacencies



[Figure 76] Experiential perspective of roof top CSA plots; emphasizing the relationship between growing and the city



[Figure 77] Experiential perspective of interior market circulation where the seasonal process of growing also acts as and architectural shading device



[Figure 78] Experiential perspective of constructed viewing steps for learning through a visual connection with the annual hydroponic growing process



level - second [program]

GREENHOUSE BLDG_

1. welcome center
2. greenhouse
[hydroponics]
[soil growing]
3. lab/classroom
4. roof top CSAs

MARKET BLDG_

5. self harvest
growing market
6. training labs



level - ground [program]

GREENHOUSE BLDG_

1. educational lobby
& exhibit space
2. library
3. cafe
4. greenhouse
[aeroponics]
5. water treatment
6. research lab
7. circulation

MARKET BLDG_

8. entry
9. food "mailboxes"
10. cafe
11. dynamic marketplace
12. specialty food retail
13. loading
14. seed bank [sorting]
15. administrative offices

PLANS



[Figure 79] Building plans



[Figure 80] Site model

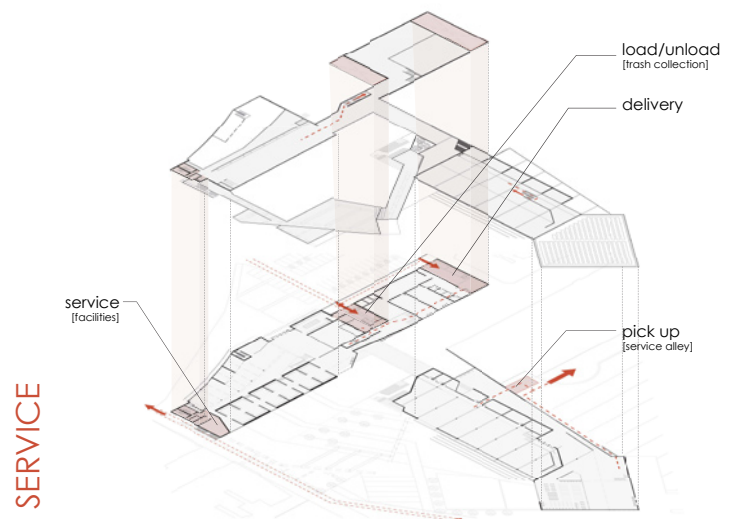
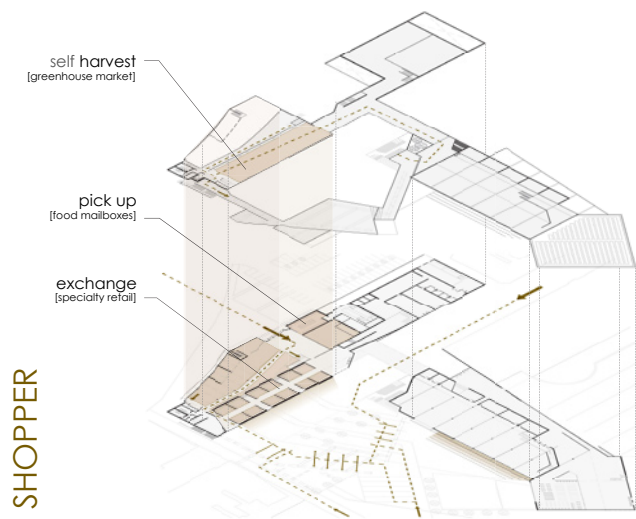
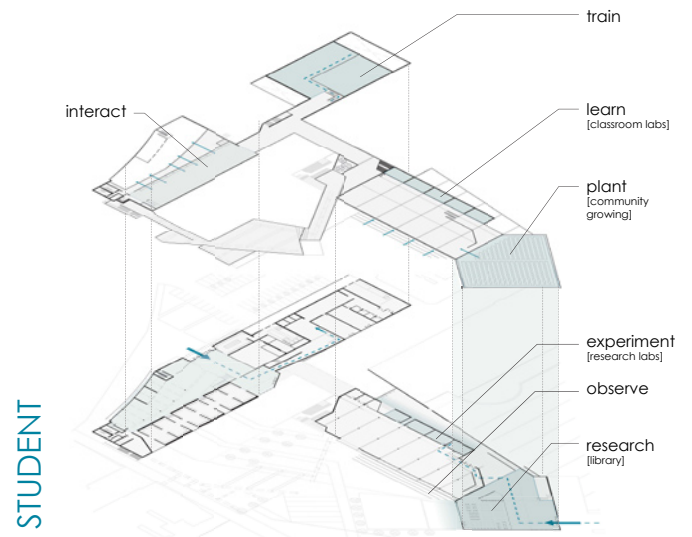
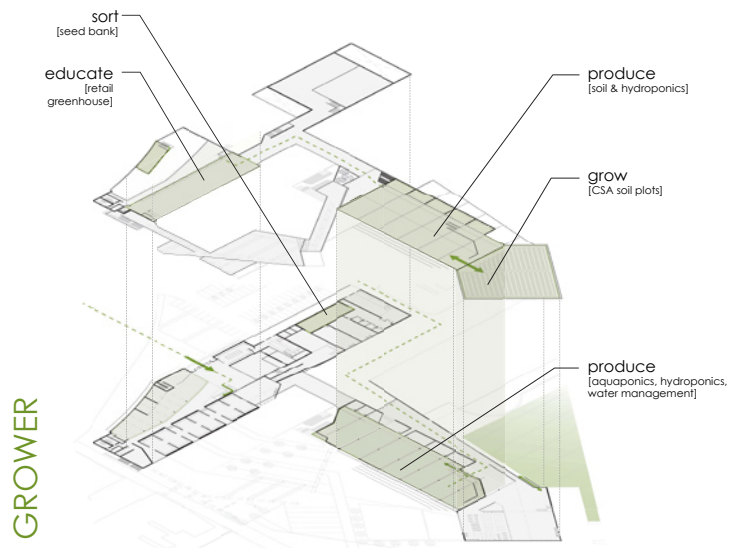
THE USER

“The best learning often occurs when people spend unplanned hours outdoors investigating, experimenting, exploring and playing - designing their own curriculum.” - David Orr

The complexity of program and site in a dense and diverse urban community fosters a diversity in user. While the site welcomes this, specific spatial forms and programs cater to the experiences of different users. For example, the greenhouse building contains areas for controlled production and more formalized education which advocates use by a grower (professional or not) and the student. The market building on the other hand, which contains zones of selling, demonstrational learning, and services, lends itself to the shopper and the administrator. Positioning on the site also builds on the intended user experience.

Designing for the user is not a new concept; however, as this thesis re-imagines building program, it too re-imagines the connections between architecture and its occupants - especially on a site with level of complexity in function. One example of a space where the user controls the architecture, is the self-harvest market. Understanding how the shopper moves through the market place and into this controlled space is only a portion of the design. Once inside this transparent greenhouse, the user is taken through a sequence of spatial zones that intimately reflect the educational program. A linear space, the shopper is guided from the wash-station - where importance of hygiene is emphasized - and then into the rows of hydroponic, vertical growing stations.

The sequencing experienced by the student is of a similar design nature. Entering on the southeast corner of the site (closest to surrounding academic institutions) the student transitions from exhibition space - where an introduction is made by visual information - and into formalized learning spaces such as the library and auditorium; eventually reaching the experimentation labs which elevate the level of learning to a first hand, interactive experience.



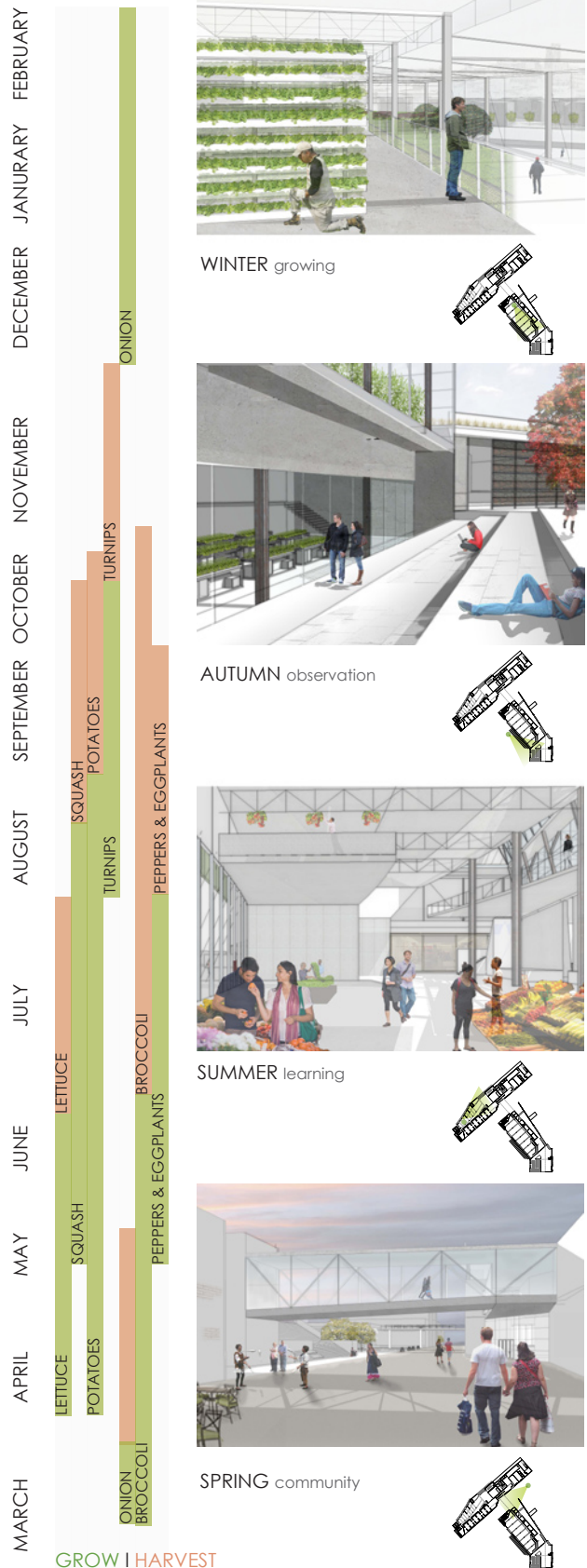
[Figure 81] Movement diagrams for different types of users

SEASONAL [EX]CHANGE

Addressing design as a participatory process in which the building lives with the community, extends architectural design into the fourth dimension – time; it teaches its occupant the relationship between permanent and impermanent and the processes of change. A variety of outdoor and controlled growing spaces, the site is used for production at all times of the year. Similarly, with a juxtaposition of indoor and outdoor market space, the process of selling is an annual event.

One area where seasonal change most greatly impacts the site is the adjacent landscape. Designed to demonstrate the true nature of agriculture, the produce grown in this 9 acre field reflects the natural conditions of the seasons.

[Figure 82] Diagram and perspectives of seasonal changes and selected crop timeline



06. CONCLUSIONS

“[The work of most architects] reflects no understanding of ecology or ecological processes. Most tell its users that knowing where they are is unimportant. Most tell its users that energy is cheap and abundant and can be squandered. Most are provisioned with material and water and dispose of their wastes in ways that tell its occupants that we are not part of the larger web of life. Most resonate with no part of our biology, experience, or aesthetic sensibilities.”

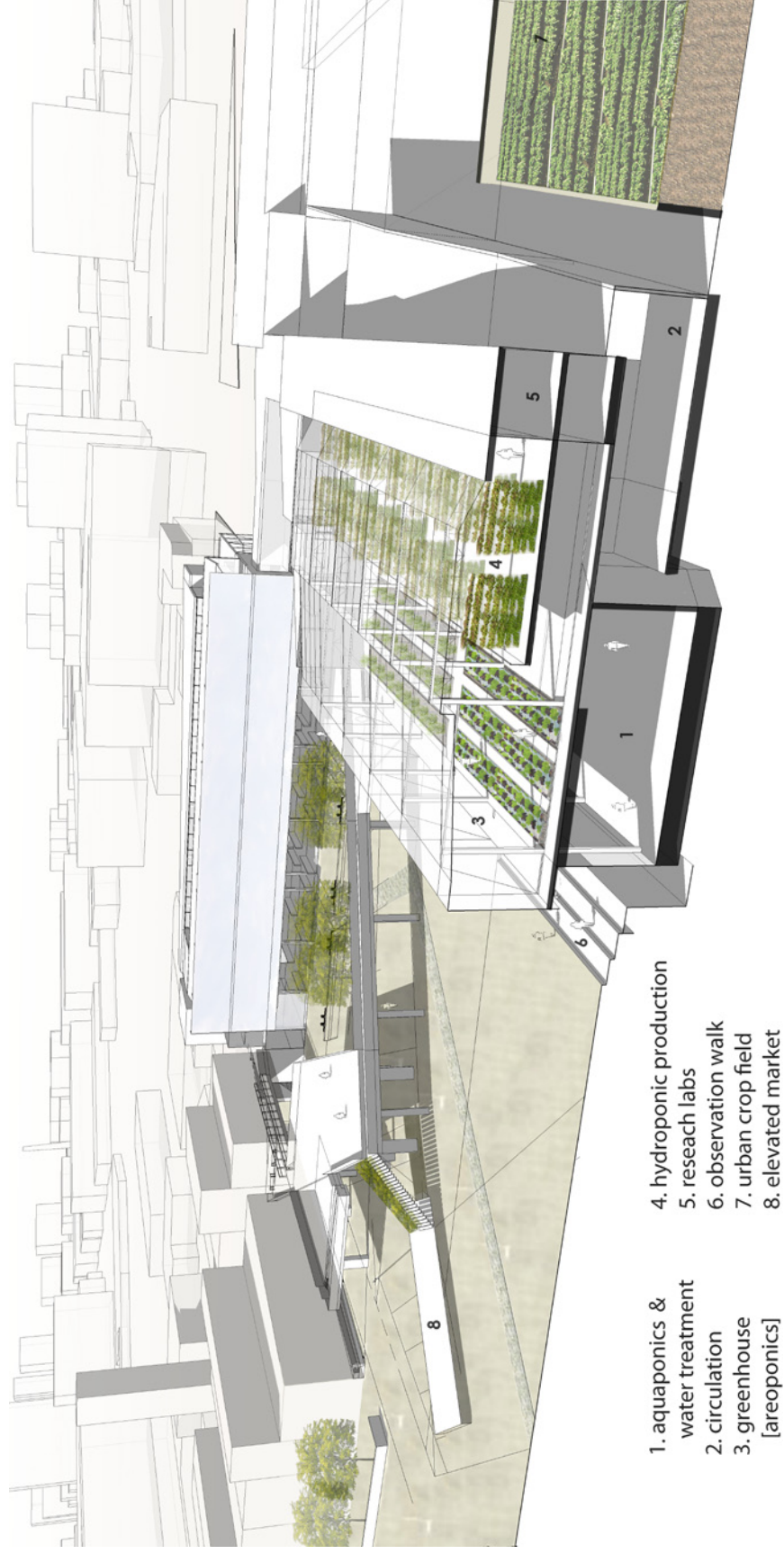
- David Orr

FOOD IN THE SCHOOLS SYSTEMS

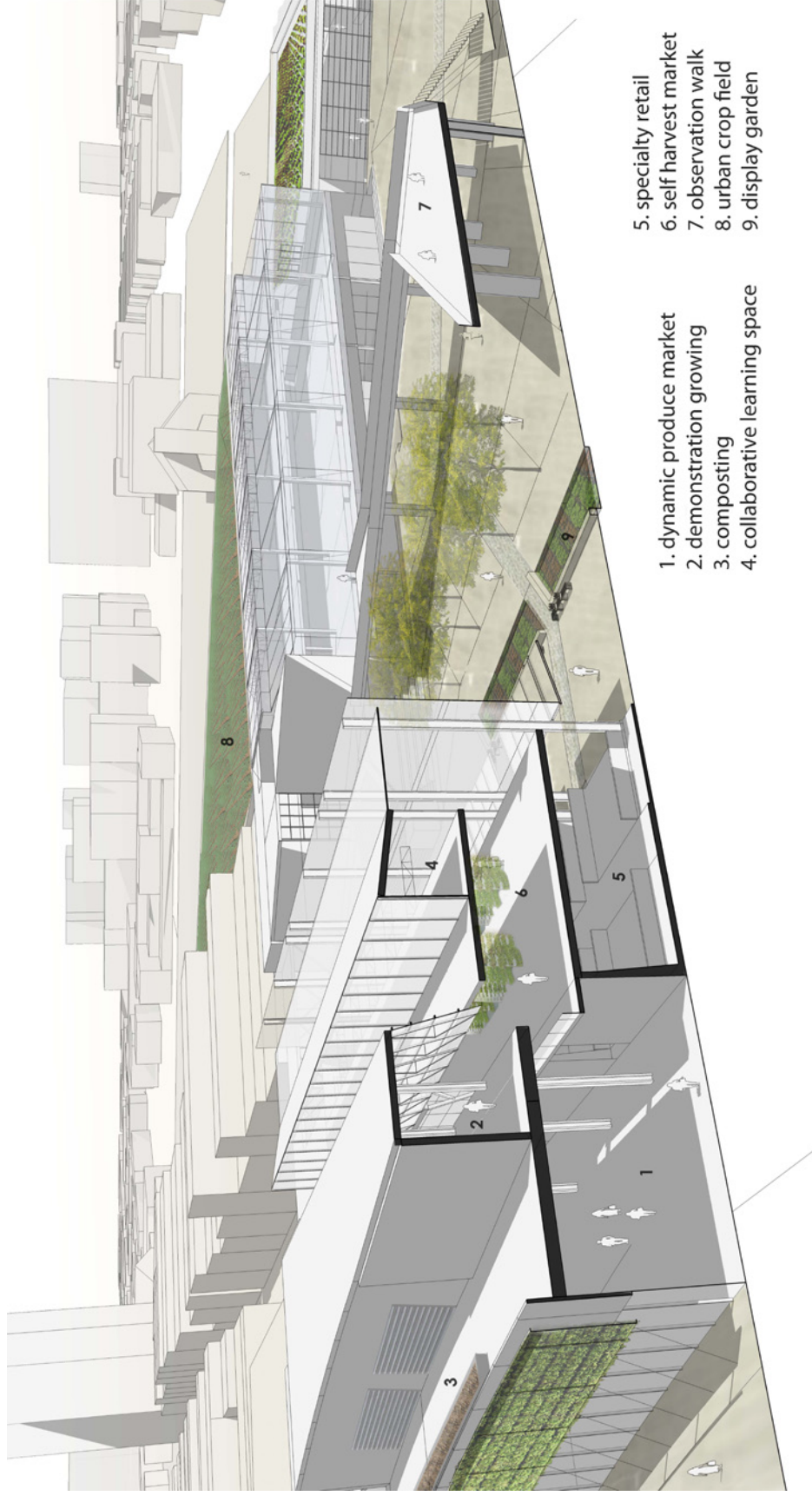
As world population grows and resources become less readily available, access to commercially produced foods will become more challenging and more expensive. Reintegrating education about growing food in the school systems is crucial to the future of both urban environments and others. Many schools have already started implementing programs designed around teaching students about vegetable gardening and farming techniques. Many however have not. In addition, current laws often restrict the interaction between locally grown food and school systems. For example, Baltimore schools are legally forbidden to serve any food grown within city limits in school cafeterias - regardless of the effect they are having from bringing in foods from outside sources. Allocating spaces in the city, adjacent to schools, for experimentation and engagement with food, such as seen in this thesis, is a crucial evolution of our built environment.

SCHOOLS IN THE FOOD SYSTEMS

Just as food must make its way back into the academic curriculum, schools must find ways to embed their sense of collaborative learning within current places of food distribution and growth. “Schools” in this sense does not only represent formal institutions, but any learning facility. High-end supermarkets are beginning to integrate pieces of information with the marketing and sales of food; however education is not a luxury to be saved for only the most elegant of supermarkets. Places of food sales must begin to dedicate spaces to training, demonstration and interactive display and sales.



[Figure 83] Section perspective through greenhouse and constructed landscape



[Figure 84] Section perspective through market place and constructed landscape

THE TEACHING ARCHITECT

“For today, socially responsible architects must serve as a bridge across borders.” - Teddy Cruz

Architects as professionals, focus on using a specialized set of design skills to challenge and reconceive of the spaces in which we live. As designers of the built world, the architect's responsibilities lay in their ability to design safe, functional, practical and just architecture that services their intended clients. As the world changes however, their social and cultural responsibilities grow, as does the need to go beyond the practicalities of buildings. This thesis challenges conventional architecture to image the opportunities created by embedding the notion of education in spatial design.

Trained to view the environment with a critical and creative eye, architects must use this perception as a teaching tool for generating self-reliant, sustainable, high performing lifestyles that respond to issues of the current local and global state. The way we feed our cities will in the very near future, become inextricably linked to architectural design. The food movement has been going on for decades, architects have just the last on board.

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